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Box Patent Application  
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First Named Inventor KOICHIRO WATANABE

**UTILITY PATENT APPLICATION TRANSMITTAL**  
( under 37 CFR 1.53(b) )

SIR:

Transmitted herewith for filing is the patent application entitled:

AUDIO CONTROL SIGNAL TRANSMISSION APPARATUS AND RECEPTION APPARATUS,  
CONTROL SYSTEM AND CONTROL METHOD USING AN AUDIO CONTROL SIGNAL, PROGRAM  
INFORMATION TRANSMISSION APPARATUS AND TRANSMISSION METHOD, AND PROGRAM  
RESERVATION APPARATUS AND PROGRAM RESERVATION METHOD

**CERTIFICATION UNDER 37 CFR § 1.10**

I hereby certify that this New Application and the documents referred to as enclosed herein are being deposited with the United States Postal Service on this date July 27, 1998, in an envelope bearing "Express Mail Post Office To Addressee" Mailing Label Number EM502815713US addressed to: Box Patent Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

HOWARD WONG

(Name of person mailing paper)

(Signature)

Enclosed are:

1. ☒ Transmittal Form (two copies required)
2. The papers required for filing date under CFR § 1.53(b):
  - i. 72 Pages of specification (including claims and abstract);
  - ii. 26 Sheets of drawings.  
    ☐ formal      ☒ informal
3. Declaration or oath
  - a. ☒ (unsigned)
4. ☐ Microfiche Computer Program (Appendix, see 37 CFR 1.96)
5. ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - i. ☐ Computer Readable Copy
  - ii. ☐ Paper Copy (identical to computer copy)
  - iii. ☐ Statement verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

6. ☐ An assignment of the invention to Sony Corporation is attached (including Form PTO-1595).
  - i. ☐ 37 CFR 3.73(b) Statement (when there is an assignee)
7. ☒ Power of Attorney (unsigned)
8. ☐ An Information Disclosure Statement (IDS) is enclosed, including a PTO-1449 and copies of ☐ references.
9. ☐ Preliminary Amendment.
10. ☒ Return Receipt Postcard (MPEP 503 -- should be specifically itemized)
11. ☐ Other

**12. FOREIGN PRIORITY**

- [x] Priority of application no. P09-201868 filed on July 28, 1997 in Japan is claimed under 35 USC 119.

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X   is filed herewith; or  
       has been filed in prior application no.        filed on       , or  
       will be provided.

### 13. FEE CALCULATION

## CLAIMS AS FILED

	Number Filed	Number Extra	Rate	Basic Fee (\$790)
Total Claims	63 - 20	* 43	x \$22.00	\$946
Independent Claims	8 - 3	* 5	x \$82.00	\$410
— Multiple dependent claim(s), if any			\$270.00	

50% Filing Fee Reduction (if applicable) . . . . . \$0

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TITLE OF THE INVENTION

Audio Control Signal Transmission Apparatus and Reception Apparatus, Control System and Control Method Using an Audio Control Signal, Program Information Transmission Apparatus and Transmission Method, and Program Reservation Apparatus and Program Reservation Method

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an audio control signal transmission apparatus and reception apparatus, control system and control method using an audio control signal, program information transmission apparatus and transmission method, and program reservation apparatus and program reservation method.

Description of the Prior Art

Conventionally, a television reception apparatus, a radio reception apparatus, a video tap recorder (VTR) having a television tuner mounted, and the like, have been controlled at a distance by using a remote controller based on infrared rays.

For example, in a video tape recorder (VTR) and a television reception apparatus having a timer reservation function, a recording reservation and a program reservation are carried out by operating the infrared-ray controller as follows.

(1) Set a timer at a reservation mode.

- (2) Set a start week and day of the week.
- (3) Set a start hour.
- (4) Set a start minute.
- (5) Set an end hour.
- (6) Set an end minute.
- (7) Set a channel to be reserved.
- (8) Set a timer reservation.

Among the aforementioned procedure steps (1) to (8), the steps (2) to (7) are carried out by setting a numeric using an up switch and a down switch for incrementing or decrementing by 1 digit, or using an input apparatus such as a 10-key switch and a bar code. Moreover, when reserving a program which is broadcast at the same time every day or every week, the a reservation is proclaimed each time so as to repeatedly use the program reservation information.

In a television reception apparatus, radio reception apparatus, video tape recorder (VTR) having a television tuner mounted, and the like, in addition to a function for receiving and demodulating an audio signal, it is necessary to provide a function for receiving and demodulating a remote control signal from a remote controller using an infrared ray so as to enable remote control using the remote controller.

Moreover, for a recording reservation and a program reservation in a video tape recorder (VTR) and a television reception apparatus having a timer reservation function, a user need to enter a necessary information for setting the reservation by looking at a program table.

## SUMMARY OF THE INVENTION

It is therefore a first object of the present invention to realize a control system for transmitting a control signal superimposed an audio signal and controlling at a distance an apparatus which can receive the signal and an apparatus connected to this apparatus; and to provide an audio control signal transmission apparatus and reception apparatus and an audio control signal based control system and control method.

A second object of the present invention is to provide a program information transmission apparatus and transmission method which can transmit a program information as an audio information signal together with an audio signal.

Yet another object of the present invention is to provide a program reservation apparatus and a program reservation method which enables to readily carry out a program reservation by using a program information indicated by an audio information signal fed together with an audio signal to be transmitted.

Still another object of the present invention is to provide a program reservation apparatus and a program reservation method which enable to readily carry out a program reservation by using a program information indicated by an audio information signal recorded and reproduced together with an audio signal via a recording medium.

The audio control signal transmission apparatus according to the present invention includes a control instruction input means for specifying a control instruction to be transmitted;

audio control signal generating means for generating an audio control signal corresponding to the control instruction specified by the control instruction input means; and signal output means for outputting the audio signal to be transmitted and the audio control signal generated by the audio control signal generating means; wherein the output means outputs an audio control signal corresponding to the control instruction and an audio signal.

Moreover, the audio control signal reception apparatus according to the present invention includes signal input means for extracting an audio control signal which has been fed together with an audio signal; control instruction determining means for determining a control instruction given as an audio control signal extracted by the signal input means; and control instruction output means for outputting the control instruction determined by the control instruction specifying means; wherein the control instruction output means outputs a control instruction corresponding to an audio control signal fed to the signal input means.

Moreover, the audio control signal reception apparatus according to the present invention includes signal input means for extracting an audio control signal which has been fed together with an audio signal; control instruction specifying means for specifying a control instruction given as an audio control signal extracted by the signal input means; and execution means to be controlled for executing the control instruction determined by the control instruction specifying

means; wherein the execution means to be controlled is controlled by executing a control instruction corresponding to an audio control signal fed to the signal input means.

@ The audio control signal based control system according to the present invention includes: an audio control signal transmission apparatus for transmitting an audio control signal corresponding to a control instruction and an audio signal to be transmitted; and an apparatus to be controlled, which receives an audio control signal transmitted together with an audio signal from the audio control signal transmission apparatus and executes a control instruction given by the audio control signal received, wherein the apparatus to be controlled is controlled by a control instruction corresponding to an audio control signal transmitted from the audio control signal transmission apparatus.

Moreover, the audio control signal based control system according to the present invention includes: an audio control signal transmission apparatus for transmitting an audio control signal corresponding to a control instruction and an audio signal to be transmitted; an audio control signal reception apparatus which receives an audio control signal transmitted together with an audio signal from the audio control signal transmission apparatus and outputs as a sound wave a control instruction corresponding to the audio control signal; and an execution apparatus to be controlled for executing the control instruction outputted as a sound wave from this audio control signal reception apparatus; wherein the execution apparatus to

be controlled is controlled by a control instruction corresponding to an audio control signal transmitted from the audio control signal transmission apparatus.

Furthermore, the audio control signal based control method according to the present invention includes: a step of generating an audio control signal corresponding to a control instruction determined; a step of transmitting the audio control signal together with an audio signal to be transmitted; a step of receiving the audio control signal together with the audio signal; a step of extracting the audio control signal received; and a step of executing a control instruction given by the audio control signal.

The program information transmission apparatus according to the present invention includes: program information input means for inputting a program information to be transmitted; audio information signal generating means for generating an audio information signal corresponding to a program information entered by the program information input means; signal multiplexing means for multiplexing an audio signal to be transmitted, with the audio information signal generated by the audio information signal generating means; and transmission means for transmitting the audio information signal and the audio signal which have been multiplexed by the signal multiplexing means, wherein a program information is transmitted as an audio information signal together with an audio signal. Moreover, the program information transmission method according to the present invention is characterized in



that an audio information signal is generated according to a program information entered, and an audio signal to be transmitted is multiplexed with the audio information signal so as to be transmitted together with the audio signal. For example, the audio signal to be transmitted and the audio information signal corresponding to a program information are transmitted by way of time division. Alternatively, an audio information signal corresponding to the program information is superimposed on the audio signal to be transmitted. As the audio information signal corresponding to a program information, it is possible to transmit a program information by a DTMF signal string. Moreover, it is possible to transmit a program information by an audio information signal indicating a G code. Furthermore, it is possible to transmit a program information by a DTMF signal string indicating a G code.

Moreover, the program reservation apparatus according to the present invention includes: reception means for receiving an audio information signal indicating a program information transmitted together with an audio signal to be transmitted; program information specifying means for extracting the audio information signal received by the reception means and specifying a program information indicated by the audio information signal; program information storage means for storing the program information determined by the program information specifying means; control means for controlling the reception means; and input means for inputting a set information to the control means; wherein the control means,

according to a reservation set information entered by the input means, by using a program information stored in the program information storage means, controls the reception means to reserve a program to be received and receive the program reserved. Furthermore, the program reservation method is characterized in that control is made to execute: a step of receiving a program information transmitted together with an audio signal to be transmitted; a step of specifying and storing a program information indicated by the audio information signal received; a step of using a program information stored, according to a reservation set information entered, and reserving a program to be received; and a step of receiving the program reserved.

@ Moreover, the program reservation apparatus according to the present invention includes: reception means for receiving an audio information signal indicating a program information transmitted together with an audio signal to be transmitted; recoding/reproduction means for recording and reproducing via a recording medium the audio information signal together with the audio signal received by the reception means; program information specifying means for extracting the audio information signal reproduced by the recording/reproduction means, so as to determine a program information indicated by the audio information signal; program information storage means for storing the program information determined by the program information specifying means; control means for controlling the reception means; and input means for inputting a set

information to the control means; wherein the control means, according to a reservation set information entered by the input means, by using a program information stored in the program information storage means, controls the reception means and the recording/reproduction means to reserve a program to be received and receive the program reserved. Furthermore, the program reservation method according to the present invention is characterized in that control is made so as to execute: a step of receiving a program information transmitted together with an audio signal to be transmitted; a step of recording/reproducing via a recording medium the audio information signal together with the audio signal received; a step of extracting the audio information signal reproduced so as to specify a program information indicated by the audio information signal; a step of storing the program specified; a step of using a program information stored, according to a reservation set information entered, so as to reserve a program to be received; and a step of receiving the program reserved.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is block diagram showing a configuration of an audio control signal transmission apparatus according to the present invention.

Fig. 2 is a block diagram showing a configuration of an encoder provided in the aforementioned audio control signal transmission apparatus.

Fig. 3 is a block diagram showing a configuration of an

audio control signal reception apparatus according to the present invention.

@ Fig. 4 is a block diagram showing a configuration of a decoder provided in the aforementioned audio control signal reception apparatus according to the present invention.

@ Fig. 5 is block diagram showing another configuration of the audio control signal transmission apparatus according to the present invention.

@ Fig. 6 is a block diagram showing a configuration example of a television transmission apparatus according to the present invention.

@ Fig. 7 is a block diagram showing a configuration example of a television reception apparatus according to the present invention.

Fig. 8 shows nominal frequencies of a DTMF signal.

Fig. 9 is a block diagram showing a configuration of an encoder which outputs a DTMF signal string as an audio control signal according to a control instruction.

Fig. 10 is a block diagram showing a decoder configuration corresponding to an encoder which outputs a DTMF signal string as an audio control signal.

Fig. 11 shows a correspondence between control instructions for executing an operation control of a television reception apparatus and audio control signals.

Fig. 12 shows a configuration of a control system for controlling operation of a video/audio signal recording and reproducing apparatus by way of audio output of a television

reception apparatus.

@ Fig. 13 shows a correspondence between control instructions for executing an operation control of a video/audio signal recording and reproducing apparatus and audio control signals.

Fig. 14 is a block diagram showing another configuration example of a television transmission apparatus according to the present invention.

@ Fig. 15 is a block diagram showing another configuration example of a television reception apparatus according to the present invention.

@ Fig. 16 shows a correspondence between control instructions for executing a character display control of a television reception apparatus and audio control signals.

Fig. 17 is a block diagram showing an example of a program information transmission apparatus according to the present invention.

Fig. 18 shows program information items required for a program reservation at a reception side.

Fig. 19 is a block diagram showing a configuration of an encoder provided in the aforementioned program information transmission apparatus.

Fig. 20 is a block diagram showing an example of an audio signal reception/recording/reproduction apparatus according to the present invention.

Fig. 21 is a block diagram showing a configuration of a decoder provided in the aforementioned audio signal reception/recording/reproduction apparatus.

Fig. 22 is a block diagram showing a configuration example of a television transmission apparatus according to the present invention.

Fig. 23 is a block diagram showing a configuration example of a video deck according to the present invention.

Fig. 24 is a block diagram showing a configuration of an encoder which outputs a DTMF signal string as an audio information signal according to a control instruction.

Fig. 25 is a block diagram showing a configuration of a decoder which corresponds to an encoder which outputs a DTMF signal string as an audio information signal.

Fig. 26 shows a DTMF signal string used in a video recording system.

Fig. 27 is a flowchart showing a processing algorithm of a video recording reservation.

Fig. 28 shows a screen on which it is displayed that a program information has been fetched.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Hereinafter, description will be directed to embodiments of the present invention with reference to the attached drawings.

Fig. 1 is a block diagram showing an example of an audio control signal transmission apparatus according to a first embodiment of the present invention.

The audio control signal transmission apparatus shown in Fig. 1 includes: a control instruction input block 11 which

determines a control instruction to be transmitted; an encoder 12 connected to this control instruction input block 11; a signal switching block 14 having an input terminal 12 connected to the encoder 12; an amplifier block 15 connected to the signal switching block 14; and a transmission block 16 to which an output signal of the amplifier block 15 is fed.

In this audio control signal transmission apparatus 10, the control instruction input block 11 determines a control instruction to be transmitted and supplies the control instruction to the encoder 12. The encoder 12 creates an audio control signal according to the control instruction supplied from the control instruction input block 11 and supplies the created audio control signal to the signal switching block 14.

Here, the encoder 12, as shown in Fig. 2, includes: a microcomputer 12A, a storage block 12B containing a correspondence table between control instructions and audio control signals; and a D/A converter block 12C which is supplied with an audio control signal information which is read out from the storage block 12B. In this encoder 12, the microcomputer 12A, according to a control instruction supplied from the control instruction input block 11, reads out an audio control signal information from the storage block 12B and supplies the information to the D/A converter block 12C. The D/A converter block 12C converts the audio control signal information read from the storage block 12B, into an analog signal so as to create an audio control signal and supplies the audio control signal to the signal switching block 14.

Moreover, the signal switching lock 14 is supplied via the input terminal 13 with an audio signal to be transmitted and switches this audio signal to the audio control signal created by the encoder 12 so as to supply the audio signal and the audio control signal as a time division multiplexed signal to the amplifier block 15. It should be noted that the audio signal includes signals of a frequency band which can be heard by a human and the audio control signal includes specific audio signals which are related with one-to-one correspondence to particular control instructions according to a predetermined rule. The amplifier block 15 amplifies the time division multiplexed signal supplied from the signal switching block 14, and supplies the amplified signal to the transmission block 16.

Furthermore, the transmission block 16 transmits the time division multiplexed signal which has been amplified by the amplifier block 15, i.e., the aforementioned audio signal and the audio control signal, as a radio wave via an antenna 17. It should be noted that in this embodiment, the signal is transmitted via an antenna but it can also be transmitted by using other transmission means such as a cable.

The audio control signal transmission apparatus 10 having the aforementioned configuration functions as an audio control signal transmission apparatus for transmitting via the antenna 17 as a radio wave an audio control signal and an audio signal which have been time division multiplexed according to a control instruction to be transmitted.

Next, Fig. 3 is a block diagram showing an example of an



audio control signal reception apparatus according to the present invention.

The audio control signal reception apparatus 20 of Fig. 3 receives a time division multiplexed signal, i.e., an audio signal and an audio control signal transmitted as a radio wave from the aforementioned audio control signal transmission apparatus 10 of Fig. 1, and includes: a reception block 22 for receiving the aforementioned time division multiplexed signal via an antenna 21; an amplifier block 23 connected to this reception block 22; an audio signal output block 24 and a decoder 25 which are connected to this amplifier 24; a control instruction output block 26 connected to this decoder 25; and the like.

In this audio control signal reception apparatus 20, the reception block 22 demodulates an audio signal from the signal received via the antenna 21 and supplies the audio signal to the amplifier block 23. Moreover, the amplifier block 23 amplifies the audio signal which has been demodulated by the reception block 22 and supplies the amplified audio signal to the audio signal output block 24 and to the decoder 25.

The audio signal output block 24 includes a loud speaker for output of the audio signal which has been amplified by the amplifier block 23.

Moreover, the decoder 25 extracts from the audio signal amplified by the amplifier block 23, an audio control signal which is related with one-to-one correspondence to a control instruction, so as to identify a control instruction

transmitted and supplies the control instruction to the control instruction output block 26. The control instruction output block 26 outputs the control instruction determined by the decoder 25.

Here, the decoder, as shown in Fig. 4 for example, includes: a band pass filter 25A which is supplied with an audio signal which has been amplified by the amplifier block 23; an A/D converter which is supplied with an output signal of the band pass filter 25A; a microcomputer 25C supplied with an information as a digitized output signal of the band pass filter 25A which has been digitized by the A/D converter block 25B; a storage block 25D containing a correspondence table indicating correspondence between control instructions and audio control signals.

In this decoder 25, the band pass filter 25A allows to pass only an audio signal of a frequency band of an audio control signal and extracts from the audio signal amplified by the amplifier block 23 only an audio control signal for supply to the A/D converter block 25B. The A/D converter block 23B digitizes the audio control signal extracted by the band pass filter 25A and supplies an audio control signal information to the microcomputer 25C. The microcomputer 25C, according to the audio control signal information, references the correspondence table between control instructions and audio control signals stored in the storage block 25D and outputs a control instruction corresponding to the audio control signal.

By combining the aforementioned audio control signal

transmission apparatus 10 and the audio control signal reception apparatus 20, it is possible to constitute a control system for transmitting a control instruction according to an audio control signal. In this case, it is possible to carry out an audio signal switching in the signal switching block 14 of the audio control signal transmission apparatus 10 in an extremely short period of time or to carry out switching according to a waveform of an audio signal inputted so that the audio control signal is hardly heard by the human ear.

It should be noted that instead of transmitting the audio signal and the audio control signal as a radio wave, it is also possible to transmit the audio signal and the audio control signal via a signal transmission path.

Moreover, Fig. 5 is a block diagram showing an audio control signal transmission apparatus according to another embodiment of the present invention.

The audio control signal transmission apparatus 30 shown in Fig. 5 includes: a control instruction input block 31 which determines a control instruction to be transmitted; an encoder 32 connected to this control instruction input block 31; an audio signal superimposing block 34 connected to the encoder 32 and an input terminal 33; an amplifier block 35 connected to this audio signal superimposing block 34; a transmission block 36 supplied with an output signal of the amplifier block 35; and the like.

In this audio control signal transmission apparatus 30, the encoder 32 generates an audio control signal corresponding

to a control instruction determined to be transmitted by the control instruction input block 31 and supplies the generated audio control signal to the audio signal superimposing block 34. The audio signal superimposing block 34 is supplied via the input terminal 33 with an audio signal to be transmitted and superimposes on this audio signal the aforementioned audio control signal generated by the encoder 32 for supply to the amplifier block 35.

Moreover, the amplifier block 35 amplifies the audio signal superimposed with the audio control signal by the signal superimposing block 34 for supply to the transmission block 36.

Furthermore, the transmission block 36 transmits the audio signal amplified by the amplifier block 35, i.e., the audio signal superimposed by the audio control signal, as a radio wave via an antenna 37.

The audio control signal transmission apparatus 30 having the aforementioned configuration functions as an audio control signal transmission apparatus for transmitting an audio signal superimposed with an audio control signal corresponding to a control instruction to be transmitted, as a radio wave via the antenna 37.

In the control system for transmitting a control instruction by way of an audio control signal constituted by combination of the audio control signal transmission apparatus and the audio control signal reception apparatus according to the present invention, a control instruction to be transmitted is transmitted together with an audio (sound) signal.

Consequently, the present invention can be applied to an apparatus having a function of receiving an audio signal such as a television reception apparatus, radio reception apparatus, video/audio signal reception/recording/reproduction apparatus, and the like. Moreover, it is possible not only to externally output a control instruction by way of an audio control signal transmitted but also to control the apparatus itself.®

Moreover, Fig. 6 is a block diagram showing a configuration of a television transmission apparatus to which the present invention is applied.

The television transmission apparatus 40 shown in Fig. 6 includes: a control instruction input block 41 which determines a control instruction to be transmitted; an encoder 42 connected to this control instruction input block 41; a signal switching block 44 connected to this encoder 42 and to a sound signal input terminal 43; a sound signal amplifier block 45 connected to this signal switching block 44; a video signal amplifier 47 connected to a video signal input terminal 46; a transmission block 48 connected to the sound signal amplifier block 45 and to the video signal amplifier block 47; and the like.

In this television transmission apparatus 40, the encoder 42 generates an audio control signal corresponding to a control instruction determined to be transmitted by the control instruction input block 41 and supplies this audio control signal to the audio signal switching block 44. The signal switching block 44 is supplied via the audio signal input

terminal 43 with a sound (audio) signal to be transmitted. This sound signal is superimposed by the aforementioned audio control signal generated by the encoder 42, so as to be supplied to the sound (audio) signal amplifier block 45. The sound signal amplifier block 45 amplifies the sound signal which has been imposed with the audio control signal by the signal switching block 44, and supplies the amplified signal to the transmission block 48. Moreover, the video signal amplifier block 47 amplifies a video signal supplied via a video signal input terminal 46 and supplies the amplified signal to the transmission block 48.

The transmission block 48 transmits via an antenna 49, the sound signal amplified by the sound signal amplifier block 45, i.e., the sound signal superimposed with the audio control signal and the video signal amplified by the video signal amplifier block 47, as a television signal. @

The television transmission apparatus 40 having the aforementioned configuration can transmit a control instruction to be transmitted, by superimposing the control instruction signal on a sound signal which can be received by a television reception apparatus.

Fig. 7 is a block diagram showing a configuration of a television reception apparatus which corresponds to the aforementioned television transmission apparatus.

The television reception apparatus 50 shown in Fig. 7 includes: a tuner block 52 for receiving the aforementioned television signal via an antenna 51; a sound signal amplifier

block 53 and a video signal amplifier block 54 which are connected to this tuner block 52; a sound signal output block 55 and a decoder 56 which are connected to the sound signal amplifier block 53; a system controller 57 connected to this decoder 56; a monitor block 58 controlled by the system controller 57; a power control block 59; and the like.

In this television reception apparatus 50, the tuner block 52 demodulates a sound signal and a video signal from the television signal received via the antenna 51 and supplies the sound signal to the sound signal amplifier block 53 and the video signal to the video signal amplifier block 54.

The sound signal amplifier block 53 amplifies the sound signal which has been demodulated by the tuner block 52, and supplies the demodulated signal to the sound signal output block 55 and to the decoder 56.

The sound signal output block 55 outputs from a loud speaker the audio signal amplified by the sound signal amplifier block 53. Moreover, the decoder 56 extracts from the audio signal amplified by the audio signal amplifier block 53, an audio control signal related to a control instruction on one-to-one basis, so as to identify the control instruction transmitted and supplies the control instruction to the system controller 57. The system controller 57 executes the control instruction determined by the decoder 56 so as to control the monitor block 58 and the power control block 59 according to the control instruction.

Moreover, the video signal amplifier block 54 amplifies

the video signal demodulated by the tuner block 52, for supply to the monitor block 58. The monitor block 58 executes a video display by the video signal amplified by the video signal amplifier block 54. Furthermore, the power control block 59 controls a power system of the entire apparatus.

The television reception apparatus 50 having the aforementioned configuration receives a television signal transmitted from the aforementioned television transmission apparatus 40 so as to obtain an audio output and a video output by the audio signal and the video signal and to execute a control instruction corresponding to an audio control signal superimposed on the aforementioned audio signal, thus enabling to control the monitor block 58 and the power control block 59.

That is, by combining the aforementioned television transmission apparatus 40 and the television reception apparatus 50, it is possible to constitute a control system using an audio control signal in which a control signal is superimposed as an audio control signal on an audio signal of a television signal transmitted by the television transmission apparatus 40, so as to control the television reception apparatus.

Here, in the aforementioned control system by an audio control signal constituted by the combination of the television transmission apparatus 40 and the television reception apparatus 50, instead of a time division transmission by switching between an audio signal and an audio control signal, it is possible to employ a method in which an audio signal is



superimposed on an audio control signal for transmission and the reception side demodulates the modulates the audio signal so that the audio control signal is isolated from the demodulated audio signal.

It should be noted that it is possible to use any featured audio signal associated with a control instruction on one-to-one basis according to a predetermined rule, but it is preferable to use a signal which has a low possibility that an audio signal which is not an audio control signal is incorrectly identified as an audio control signal by the reception side.

As the audio control signal having such a low possibility of incorrect identification, for example, it is possible to use a DTMF (dual tone multi-frequency) signal string.

The DTMF signal is already used in practice for a telephone push line. As shown in Fig. 8, the DTMF signal is defined as 16 signals obtained by four audio signals, each having a different frequency: 697 Hz, 770 Hz, 852 Hz, and 941 Hz in combination with four audio signals, each having a different frequency: 1209 Hz, 1336 Hz, 1477 Hz, and 1633 Hz. A 16-pushbutton dial 60 is assigned for the 16 signals thus obtained.

That is, in the DTMF signal, for example, an audio signal of 1209 Hz superimposed by an audio signal of 697 Hz indicates "1".

A circuit for generating the DTMF signal is available on maret as an integrated circuit of DTMF tone encoder. For

example, if "1" is entered, the DTMF encoder outputs an audio signal of 1209 Hz superimposed on an audio signal of 697 Hz. Moreover, a circuit for extracting a DTMF signal from an input audio signal is available on market as an integrated circuit fDTMF tone decoder. If an input audio signal contains both of the audio signal of 1209 Hz and the audio signal of 697 Hz, the DTMF tone decoder outputs "1".

Fig. 9 is a block diagram showing a configuration of an encoder for generating a DTMF signal string as an audio control signal corresponding to a control instruction.

The encoder 70 shown in Fig. 9 includes: a microcomputer 71; a storage block 72 containing a table of correspondence between control instructions and DTMF signal strings; and a DTMF tone encoder 73.

In this encoder 70, the microcomputer 71, according to a control instruction inputted, references the table of correspondence between control instructions and DTMF signal strings stored in the storage block 72 and supplies to the DTMF tone encoder 73, a control information indicating a DTMF signal string corresponding to the control instruction inputted. The DTMF tone encoder 73, according to the control information supplied by the microcomputer 71, outputs a DTMF signal string corresponding to the control instruction.

By using the encoder 70 having the aforementioned configuration, it is possible to constitute an audio control signal transmission apparatus for transmitting a DTMF signal string as an audio control signal corresponding to a control

instruction.

Moreover, Fig. 10 is a block diagram showing a configuration of a decoder 80 which corresponds to the decoder 70 shown in Fig. 9.

The decoder 80 of Fig. 10 includes: a DTMF tone decoder 81; a microcomputer 82; and a storage block 83 containing a table of correspondence between control instructions and DTMF signal strings.

In this decoder 80, the DTMF tone decoder 81 analyzes frequency components contained in the audio signal inputted and supplies to the microcomputer 82 a decode information indicating a DTMF signal string inputted as the audio signal. The microcomputer 82, according to the decode information supplied from the DTMF tone decoder 81, references the table of correspondence between control instructions and DTMF signal strings stored in the storage block 83 and outputs a control instruction corresponding to the inputted DTMF signal string indicated by the aforementioned decode information.

@ By using the decoder 80 having the aforementioned configuration, it is possible to constitute an audio control signal reception apparatus for receiving a DTMF signal string as an audio control signal corresponding to a control instruction.

Consequently, by using the aforementioned encoder 70 as the aforementioned encoder 12, 32, 42 in the audio control signal transmission apparatus 10, 30 and the television transmission apparatus 40, and by using the aforementioned

decoder 80 as the aforementioned decoder 25, 56 in the audio control signal reception apparatus 20 and the television reception apparatus 50, it is possible to constitute a control system using an audio control signal which can transmit a DTMF signal as an audio control signal so as to control the audio control signal reception apparatus 20 and the television reception apparatus 50.

Here, Fig. 11 shows an example of table of correspondence between control instructions for controlling the television reception apparatus 50 and audio control signals.

In the table of correspondence shown in Fig. 11, "video output off", i.e., a control instruction to inhibit a video output corresponds to a DTMF signal string of "1#". Moreover, "video output on", i.e., a control instruction to output a video corresponds to a DTMF signal string of "2#". Furthermore, "power off", i.e., a control instruction to turn off power corresponds to a DTMF signal string of "3#".

Consequently, by transmitting from the television transmission apparatus 40 a television signal containing the audio control signals, i.e., DTMF signal strings defined in the table of correspondence in Fig. 11, it is possible to control the television reception apparatus 50 as follows. If a television signal containing the DTMF signal of "1#" is received, the television reception apparatus 50 is controlled not to execute video output. Moreover, if a television signal containing the DTMF signal string of "2#" is received, the television reception apparatus 50 is controlled to output

video. Furthermore, if a television signal containing the DTMF signal string of "3#" is received, the television reception apparatus 50 is controlled so as to turn off power of the entire apparatus.

It should be noted that Fig. 11 shows an example of table of correspondence between control instructions for controlling the television reception apparatus 50 and audio control signals, but any apparatus having an audio signal reception function such as a radio reception apparatus and a video/audio signal reception/recording/reproduction apparatus can be controlled according to a control instruction transmitted as an audio control signal.

Here, in the control system using an audio control signal constituted by combination of the aforementioned television transmission apparatus 40 and the television reception apparatus, instead of time division transmission by switching between an audio signal to an audio control signal, it is possible to employ a method in which an audio signal is superimposed on an audio control signal so that the reception side can isolate/extract the audio control signal from the audio signal demodulated.

Moreover, an audio signal and an audio control signal need not be always transmitted as a radio wave but can be transmitted as a sound wave from a loud speaker so that an audio control signal is entered via a microphone to an apparatus to be controlled.

For example, by superimposing on an audio signal to be

transmitted, an audio control signal corresponding to a control instruction for controlling operation of a video/audio signal recording/reproduction apparatus, as shown in Fig. 12, it is possible to constitute a control system for controlling operation of the video/audio signal recording/reproduction apparatus via the television reception apparatus 50 which receives the aforementioned television signal.

In the control system shown in Fig. 12, the video/audio signal recording/reproduction apparatus 90 has the encoder 80 shown in Fig. 10 as a built-in component so that the audio control signal outputted together with the audio signal from the audio output block 55 of the television reception apparatus 50 is entered via a microphone 91 to the aforementioned encoder 80.

Here, a control instruction for controlling operation of the aforementioned video/audio signal recording/reproduction apparatus 90 may be Power ON, Power OFF, Stop, and the like which are assigned for the DTMF signals as shown in a table of correspondence between control instructions and audio control signals shown in Fig. 13.

In this control system, if the audio output block 55 of the aforementioned television reception apparatus 50 outputs an audio signal containing an audio control signal consisting of, for example, a DTMF signal string of "21#", the aforementioned video/audio signal recording/reproduction apparatus 90 executes a control instruction specified by the audio control signal so that an operation control is

automatically carried out to turn on power corresponding to the DTMF signal string of "21#". Moreover, this video/audio signal recording/reproduction apparatus 90 executes a control instruction given by the audio control signal, so as to execute an operation control such as cutting off power corresponding to a DTMF signal string of "22#" and starting recording corresponding to a DTMF signal string of "23#".

Moreover, the aforementioned audio control signal can be used not only for giving an operation control instruction for controlling operation of an apparatus to be controlled but also for giving a character display control instruction for character display.

Fig. 14 is a block diagram showing a configuration of a television transmission apparatus for giving as an audio control signal, a character display control instruction for character display.

The television transmission apparatus 100 shown in Fig. 14 includes: a character information input block 101 for specifying a character information to be transmitted; an encoder connected to this character information input block 101; a signal switching block 104 connected to the encoder 102 and to an audio signal input terminal 103; an audio signal amplifier block 105 connected to this signal switching block 104; a video signal amplifier block 107 connected to a video signal input terminal 106; a transmission block 108 connected to the aforementioned audio signal amplifier block 105 and the video signal amplifier block 107; and the like.

In this television transmission apparatus 100, the encoder 102 generates an audio control signal corresponding to a character information determined to be transmitted by the character information input block 101, and supplies the audio control signal to the audio signal switching block 104. The aforementioned signal switching block 104 is supplied via the input terminal 103 with an audio signal to be transmitted, and superimposes on this audio signal the audio control signal generated by the encoder 102, so as to be supplied to the audio signal amplifier block 105. The audio signal amplifier 105 amplifies the audio signal superimposed with the audio control signal by the signal switching block 104, for supply to the transmission block 108. Moreover, the video signal amplifier block 107 amplifies a video signal supplied via the video signal input terminal 104, and transmits the amplified video signal to the transmission block 108.

The transmission block 108 transmits the audio signal amplified by the audio signal amplifier block 105, i.e., the audio signal superimposed with the audio control signal and the video signal amplified by the video signal amplifier block 107, as a television signal via an antenna 109.

In the television transmission apparatus 100 having the aforementioned configuration, it is possible to transmit a character information to be transmitted by superimposing the character information on an audio signal which can be received by a television reception apparatus.

Fig. 15 is a block diagram showing a configuration of a



television reception apparatus 110 which corresponds to the aforementioned television transmission apparatus 100.

The television reception apparatus 110 shown in Fig. 15 includes: a tuner block 112 for receiving the aforementioned television signal via an antenna 111; an audio signal amplifier block 113 and a video signal amplifier block 114 which are connected to the tuner block 112; an audio signal output block 115 and a decoder 116 which are connected to the audio signal amplifier block 113; a character generator 117 connected to the decoder 116; a monitor block 118 supplied with an output of the video signal amplifier block 114 and an output of the character generator 117.

In this television reception apparatus 110, the tuner block 112 demodulates an audio signal and a video signal from the television signal received via the antenna 111, and supplies the audio signal to the audio signal amplifier block 113 and the video signal to the video signal amplifier block 114.

The audio signal amplifier block 113 amplifies the audio signal demodulated by the tuner block 112 and supplies the demodulated signal to the audio signal output block 115 and to the decoder 116.

The audio signal output block 115 outputs from a loud speaker the audio signal amplified by the audio signal amplifier block 113. Moreover, the decoder 116 extracts an audio control signal corresponding to a character information, from the audio signal amplified by the audio signal amplifier

block 113, so as to identify a character information transmitted and supplies this character information to the character generator 117. The character generator 117 supplies to the monitor block 118, a character display signal for displaying the character information determined by the decoder 116.

Moreover, the video signal amplifier block 14 amplifies the video signal demodulated by the tuner block 112, for supply to the monitor block 118. The monitor block 118 executes an image display by the video signal amplified by the video signal amplifier block 114 and executes a character display according to a character display signal supplied from the character generator 117, i.e., a screen display of the character information determined by the decoder 116.

Here, Fig. 16 shows an example of correspondence between character information items for displaying a character information by the television reception apparatus 100 and audio control signals.

In the table of correspondence shown in Fig. 16, a character information "A" corresponds to a DTMF signal string of "001#". Moreover, a character information "B" corresponds to a DTMF signal string of "002#". Furthermore, a character information "AB" corresponds to a DTMF signal string of "003#". As shown in Fig. 16, in the correspondence between character information items and audio control signals, one character need not correspond to one audio control signal. By relating a character string which has a high transmission frequency to one

audio control signal, it is possible to transmit a character information with a high efficiency.

The television reception apparatus 110 having the aforementioned configuration receives a television signal transmitted from the aforementioned television transmission apparatus 100, which enables not only to obtain a sound output and an image output according to the audio signal and the video signal but also to display on a screen by the monitor block 118 a character information corresponding to an audio control signal transmitted as superimposed on the aforementioned audio signal.

That is, by using the aforementioned television transmission apparatus 100 in combination with the television reception apparatus 110, it is possible to constitute a control system in which a character information is superimposed as an audio control signal on an audio signal of a television signal, so as to control to execute a character display by the television reception apparatus 110.

It should be noted that in a control system constituted by using the aforementioned television transmission apparatus 100 in combination with the television reception apparatus 110,, instead of time division transmission by switching an audio signal to an audio control signal, it is possible to employ a method in which an audio signal is superimposed on an audio control signal for transmission so that the audio control signal is isolated/extracted from the audio signal demodulated by the reception side.

Fig. 17 is a block diagram showing an example of program information transmission apparatus according to another embodiment of the present invention.

The program information transmission apparatus 120 shown in Fig. 17 includes: a program information input block 211; an encoder 212 connected to this program information input block 211; a signal switching block 214 having an input terminal 213 connected to the encoder 212; a transmission block 215 connected to the signal switching block 214; and the like.

In this program information transmission apparatus 210, as shown in Fig. 18, the program information input block 211 supplies to the encoder 212 a program information including information required for a program reservation at a reception side including a broadcast date, broadcast start time, broadcast end time, broadcast channel, and the like.

Here, the encoder 212, as shown in Fig. 19 for example, includes: a microcomputer 212A; a storage 212B containing a table of correspondence between program information items and audio information signals; and a D/A converter block 212C supplied with a digital signal of an audio information signal which is read out from the storage block 212B. In this encoder 212, the microcomputer 212A, according to an information supplied from the program information input block 211, reads out an audio information signal from the storage block 212B for supply to the D/A converter 212C. The D/A converter 212C converts the audio information signal read out from the storage block 212B, into an analog signal for supply to the signal

switching block 214.

The signal switching block 214 is supplied via the input terminal 213 with an audio signal to be transmitted and switches this audio signal to the audio information signal generated by the encoder 212 so that the audio signal and the audio information signal are time-division multiplexed for supply to the transmission block 215. It should be noted that the audio signal is a signal of frequency band which can be heard by a human ear. Moreover, the audio information signal is a featured audio signal based on one-to-one correspondence with a program information according to a predetermined rule.

The aforementioned transmission block 215 transmits the time-division multiplexed signal, i.e., the audio signal and the audio information signal supplied from the signal switching block 214, as a radio wave via an antenna 216.

The program information transmission apparatus 210 having the aforementioned configuration serves as a radio broadcast apparatus which transmits an audio information signal indicating a program information and an audio signal which have been time-division multiplexed, as a radio wave via the antenna 216.

Next, Fig. 20 is a block diagram showing an example of audio signal reception/recording/reproduction apparatus according to the present invention.

The audio signal reception/recording/reproduction apparatus 220 shown in Fig. 20 receives a time-division multiplexed signal, i.e., an audio signal and an audio

information signal transmitted as a radio wave from the program information transmission apparatus 210 shown in Fig. 17, and includes: a reception block 222 for receiving the aforementioned time-division multiplexed signal via an antenna 221; an audio signal recording/reproduction block 223, an audio signal output block 224, and a decoder 225 which are connected to this reception block 222; a program information storage block 226 connected to this decoder 225; a control block 227 for controlling the reception block 222 and the audio signal recording/reproduction block 223; an input block 228 for giving a user set information to the control block 227; and the like.

In this audio signal reception/recording/reproduction apparatus 220, the reception block 222, according to a control instruction from the control block 227, demodulates an audio signal from the signal received via the antenna 221. The reception block 222 supplies the demodulated audio signal to the audio signal recording/reproduction block 223, the audio signal output block 224, and the decoder 225.

Moreover, the audio signal recording/reproduction block 223, according to a control instruction from the control block 227, records on a recording medium 229 an audio signal supplied from the reception block 222 or reproduces an audio signal from the recording medium 229 for supply to the audio signal output block 224.

Furthermore, the audio signal output block 224 includes a loud speaker and outputs an audio signal supplied from the reception block 222 or the audio signal recording/reproduction

block 223.

Moreover, the decoder 225 extracts from the audio signal received by the reception block 222, an audio information signal related to a program information based on one-to-one correspondence, so as to identify a program information transmitted and supplies this program information to the program information storage block 226. The program information storage block 226 stores the program information determined by the decoder 225.

Furthermore, the control block 227 includes a microcomputer. According to a program reservation information entered through the input block 228, the control block 227 controls the reception block 222 and the audio signal recording/reproduction block 223 so as to carry out a program reservation based on a program information stored in the program information storage block 226 and record on the recording medium 229 an audio signal of the program reserved.

Here, the decoder 225, as shown in Fig. 21 for example, includes: a band pass filter 225A supplied with an audio signal received by the reception block 222; an A/D converter block 225B which is supplied with an output signal of the band pass filter 225A; a microcomputer 225C which is supplied with an output signal of the band pass filter 225A which has been digitized by the A/D converter block 225B; and a storage block 225D containing a table of correspondence between program information and audio information signals.

In this decoder 225, the band pass filter 225A allows to

pass only an audio signal having a frequency band of the audio information signal and extracts from the audio signal received by the reception block 222, an audio information signal for supply to the A/D converter block 225B. The A/D converter block 225B digitizes the audio information signal extracted by the band pass filter, for supply to the microcomputer 225C. The microcomputer 225C, according to the audio information signal, references the table of correspondence between program information and audio information signals stored in the storage block 225D and outputs a program information corresponding to the audio information signal.

By using the aforementioned program information transmission apparatus 210 in combination with the aforementioned audio signal reception/recording/reproduction apparatus 220, it is possible to constitute a program reservation system for carrying out a program reservation by transmitting a program information by way of an audio information signal. In this case, it is possible to carry out switching of an audio signal by the signal switching block 214 of the program information transmission apparatus 210 in an extremely short time or to carry out switching according to a waveform of an audio signal entered so that a program information signal is intentionally made difficult to be heard by a human ear.

It should be noted that instead of transmitting the audio signal and the audio information signal by air, it is also possible to transmit the audio signal and the audio information



signal via a signal transmission path.

Moreover, in the audio signal reception/recording/reproduction apparatus 220 shown in Fig. 20, an audio signal received by the reception block 222 is supplied to the decoder so that the decoder 225 extracts an audio information signal so as to obtain a program information. Instead, it is also possible that an audio signal containing an audio information signal received by the reception block 222 is recorded on the recording medium 229 by the audio signal reception/recording/reproduction block 223 and an audio signal reproduced from the recording medium 229 is supplied to the decoder 225 so that the decoder 225 extracts an audio information signal so as to obtain a program information.

Next, explanation will be given on a video recording reservation system to which the present invention is applied.

This video recording system is constituted by a television broadcast apparatus 240 having a configuration shown in Fig. 22 and a video deck 250 having a configuration shown in Fig. 23.

The television transmission apparatus 240 shown in Fig. 22 to which the program information transmission apparatus according to the present invention is applied includes: a program information input block 241; an encoder 242 connected to this program information input block 241; an audio signal switching block 244 connected to the encoder 242 and an audio signal input terminal 243; a transmission block 246 connected to the signal switching block 244 and a video signal input

terminal 245; and the like.

In this television transmission apparatus 240, the encoder 242 generates an audio information signal corresponding to a program information supplied from the program information input block 241 and supplies the audio information signal to the audio signal switching block 244. The audio signal switching block 244 is supplied via the audio signal input terminal 243 with an audio signal to be transmitted and superimposes on this audio signal the audio information signal generated by the encoder 242 for supply to the transmission block 246.

The transmission block 246 transmits a video signal supplied via the video signal input terminal 244 and the audio signal superimposed with the audio information signal by the audio signal switching block 244, as a television signal via an antenna 247.

The television transmission apparatus 240 having the aforementioned configuration can transmit a program information as an audio information signal superimposed on an audio signal which can be received by a television reception apparatus.

Fig. 23 is a block diagram showing a configuration of a video deck 250 on which a television tuner corresponding to the aforementioned television transmission apparatus 240 is mounted.

The video deck 250 shown in Fig. 23 includes: a tuner block 252 for receiving the aforementioned television signal via an antenna 251; a video/audio signal recording/reproduction block 253, a video signal output block 254, an audio signal

output block 255, and a decoder 256 which are connected to the tuner 252; a program information storage block 257 connected to the decoder 256; a control block 258 for controlling the tuner block 252 and the video/audio signal recording/reproduction block 253; an input block 259 for supplying a user set information to the control block 258; and the like.

In this video deck 250, the tuner block 252, according to a control instruction from the control block 258, demodulates an audio signal and a video signal from the television signal received via the antenna 251. The video signal demodulated by this tuner block 252 is supplied to the video/audio signal recording/reproduction block 253 and, via the video signal output block 254, outputted externally. Moreover, the audio signal demodulated is supplied to the video/audio signal recording/reproduction block 253 and to the decoder 256, and outputted externally via the audio signal output block 255.

Moreover, the vide/audio signal recording/reproduction block 253, according to a control instruction from the control block 258, records on a recording medium 160 a video signal and an audio signal supplied from the tuner block 252, or reproduces from the recording medium 160 a video signal and an audio signal and outputs the signals externally via the video signal output block 254 and the audio signal output block 255.

Moreover, the decoder 256 extracts from the audio signal demodulated by the tuner block 252, an audio information signal based on one-to-one correspondence with a program information,

so as to identify a program information transmitted and supplies the program information to the program information storage block 257. The program information storage block 257 stores the program information determined by the decoder 256.

The control block 258 includes a microcomputer. According to a program reservation set information inputted from the input block 259 having an operation key or the like, the control block 258 controls the aforementioned tuner block 252 and the video/audio signal recording/reproduction block 253 to carry out a program reservation according to a program information stored in the program information storage block 257 and to record on the recording medium 259 an audio signal of the program reserved.

Here, in a video recording reservation system using an audio information signal constituted by using the aforementioned television transmission apparatus 240 in combination with the video deck 250, instead of time-division transmission by switching of an audio signal to an audio information signal, it is possible to employ the method in which an audio signal superimposed on an audio information signal is transmitted so that the audio information signal is isolated/extracted from the audio signal demodulated by the reception side.

It should be noted that the audio information signal may be any audio signal featured on one-to-one correspondence with a program information according to a predetermined rule. However, it is preferable to use a signal having a low

possibility of incorrect identification of an audio signal other than an audio information signal as an audio information signal by the reception side.

As an audio information having a low possibility of the aforementioned incorrect identification, for example, it is possible to use a DTMF (dual tone multi-frequency) signal.

This DTMF signal is identical as the one shown in the aforementioned Fig. 8, and its explanation is omitted here.

Fig. 24 is a block diagram showing a configuration of encoder for generating a DTMF signal string as an audio information signal corresponding to a program information.

The encoder 270 shown in Fig. 23 includes: a microcomputer 271; a storage block 272 containing a table of correspondence between program information items and DTMF signal strings; and a DTMF tone encoder 273.

In this encoder 270, the microcomputer 271, according to a program information entered, references the table of correspondence between a program information and DTMF signal strings stored in the storage block 272 and supplies to the DTMF tone encoder 273, a control information indicating a DTMF signal string corresponding to the program information entered. The DTMF tone encoder 273, according to the control information given by the microcomputer 271, outputs a DTMF signal string corresponding to the program information.

By using the encoder 270 having the aforementioned configuration, it is possible to constitute a program information signal transmission apparatus for transmitting a

DTMF signal string as an audio information signal corresponding to a program information.

Moreover, Fig. 25 is a block diagram showing a configuration of a decoder 280 which corresponds to the encoder 270 shown in the aforementioned Fig. 24.

The decoder 280 shown in Fig. 25 includes: a DTMF tone decoder 281; a microcomputer 282; and a storage block 283 containing a table of correspondence between program information items and DTMF signal strings.

In this decoder 280, the DTMF tone decoder 281 analyzes a frequency component contained in an audio signal entered and supplies to the microcomputer 282 a decode information indicating the DTMF signal string entered as the audio signal. The microcomputer 282, according to the decode information supplied from the DTMF tone decoder 281, references the table of correspondence between program information items and DTMF signal strings stored in the storage block 283 and outputs a program information corresponding to the DTMF signal string entered.

By using the decoder 280 having the aforementioned configuration, it is possible to constitute a program information signal reception apparatus for receiving a DTMF signal string as an audio information signal corresponding to a program information.

Consequently, by using the aforementioned encoder 270 as the encoder 242 in the aforementioned television transmission apparatus 240 in combination with the aforementioned decoder

280 as the decoder 256 in the aforementioned video deck 250, it is possible to constitute an audio information signal based program reservation system capable of transmitting a DTMF signal string as an audio information signal corresponding to a program information, so as to control the vide deck 250.

It should be noted that instead of transmitting a television signal containing the aforementioned audio information signal as a radio wave, it is possible to transmit the television signal via a signal transmission path.

Moreover, in this video recording reservation system, an audio signal received by the tuner block 252 of the video deck 250 is supplied to the decoder 256 so that the decoder 256 extracts an audio information signal to obtain a program information, but it is also possible that a video/audio signal containing an audio information signal received by the tuner block 252 is recorded in the recording medium 259 by the video/audio signal reception/recording/reproduction block 253 and an audio signal reproduced from this recording medium 259 is supplied to the decoder, so that the decoder extracts an audio information signal to obtain a program information.

Here, Fig. 26 shows an example of table of correspondence between a program information items and audio information signals for controlling the aforementioned video deck 250.

In this table of correspondence, "#" and "\*" used as a header to identify an audio information signal superimposed on an audio signal are assigned for data #0 and data #1; data #6 to #9 are assigned for a program start time; and data #10 to

#13 are assigned for a program end time. Furthermore, #14 to #16 are assigned for broadcast channels.

Consequently, for example, a program to be broadcast on March 30, from 12 o'clock 30 minutes to 14 o'clock 00 minutes at channel 12 constitutes a sound string of "#\*033012301400012".

That is, the aforementioned television transmission apparatus 230 broadcasts a television signal containing an audio information signal indicating a sound string of "#\*033012301400012" and the video deck 250 which has received the television broadcast can recognize the audio information signal contained in the television signal as a program information for a program to be broadcast on March 30, from 12 o'clock 00 minute to 14 o'clock 00 minute, at channel 12. According to a program reservation set information entered from the input block, the aforementioned program information can be specified for video recording reservation.

It should be noted that instead of the DTMF signal, a G code can be created as the audio information signal corresponding to a program information to be transmitted so that the program information is transmitted by an audio information signal indicating the G code. Moreover, as the G code is constituted by combinations of numeric 0 to 9, it is possible to convert this G code into a DTMF signal for transmission.

Moreover, the video deck 250 in the aforementioned video recording reservation system carries out a video recording



reservation according to an algorithm shown in a flowchart of Fig. 27.

That is, according to this algorithm of video recording reservation, firstly, in step S1, it is decided whether a program information is obtained. This decision is repeatedly made until a program information is obtained. When a program information is obtained, control is passed to the next step S2.

In step S2, a mark indicating that a program information has been obtained is superimposed on a video signal for output from the video signal output block 254. Thus, as shown in Fig. 28 for example, a mark M is displayed on the screen indicating that a program information has been obtained.

Next, in step S3, a decision is made whether a reservation set information entered from the input block 259 has been accepted. If no reservation set information has been accepted, control is passed to step S4. If a reservation set information has been accepted, control is passed to step S5.

In step S4, a decision is made whether a predetermined period of time has elapsed after a program information is fetched. If the predetermined period of time has not been elapsed, control is returned to step S3 so as to repeatedly execute the decision processing whether a reservation set information has been accepted. Moreover, if the aforementioned predetermined period of time has elapsed, control is passed to step S6.

In step S5, a program reservation is carried out according to the program information fetched, and control is passed to

step S6.

In step S6, output of the mark indicating that a program information has been fetched, from the video signal output block 54 is terminated, and control is returned to step S1.

That is, in this video deck 250, when an audio information signal is received and a program information is fetched, as shown in Fig. 28, a mark M indicating that a program information has been fetched is superimposed on a video signal for output from the video signal output block 254 for a predetermined period of time, during which a reservation set information entered from the input block 259 is accepted for carrying out a program reservation.

It should be noted that in the video deck 250 which carries out a video recording reservation according to the aforementioned algorithm, only during a predetermined period of time while the mark M indicating that a program information has been fetched is superimposed on a video signal and outputted from the video signal output block 250, a program reservation can be carried out according to the program information fetched. However, it is also possible to retain a program information fetched, in the program information storage block 257 for a predetermined period such as one day so that in response to a reservation set information entered from the input block 259, a video reservation can be carried out according to the program information retained in the program information storage block 257.

Here, in the program reservation method according to the

present invention, a program information to be transmitted is transmitted as an audio information signal together with an audio signal. Consequently, the present invention can be applied to an apparatus having a function of receiving an audio signal such as a television reception apparatus, radio reception apparatus, video/audio signal reception/recording/reproduction apparatus. By using a program information indicated by the audio information signal, it is possible to readily carry out a program reservation.

In the audio control signal transmission apparatus according to the present invention, an audio control signal corresponding to a control instruction specified by the control instruction input means is created by the audio control signal generating means, so that an audio signal to be transmitted is outputted together with the audio control signal from the signal output means as a radio wave or sound wave. Consequently, it is possible to transmit an audio control signal corresponding to a control instruction specified by the control instruction input means, to reception means having a function for receiving the audio control signal.

In the audio control signal reception apparatus according to the present invention, an audio control signal inputted together with an audio signal to the signal input means is extracted so that a control instruction given as this audio control signal is specified by the control instruction specifying means and this control instruction is outputted from the control instruction output means. Consequently, it is

possible to supply to means to be controlled, a control instruction corresponding to an audio control signal entered through the signal input means.

Moreover, in the audio control signal reception apparatus according to the present invention, an audio control signal inputted together with an audio signal to the signal input means is extracted so that a control instruction given as this audio control signal is specified by the control instruction specifying means and this control instruction is executed, enabling to operate means to be controlled, by the control instruction corresponding to the audio control signal entered through the signal input means.

Moreover, in the audio control signal based control system according to the present invention, it is possible to control an apparatus to be controlled, by using a control instruction corresponding to an audio control signal transmitted from the audio control signal transmission apparatus.

Moreover, in the audio control signal based control system according to the present invention, an audio control signal reception apparatus is provided for outputting as a sound wave a control instruction corresponding to an audio control signal transmitted from an audio control signal transmission apparatus, thus enabling to control an apparatus to be controlled, via this audio control signal reception apparatus. That is, it is possible to control an apparatus to be controlled, by using a control instruction corresponding to an audio control signal transmitted from the audio control signal

transmission apparatus.

Furthermore, in the audio control signal based control method according to the present invention, an audio control signal is generated corresponding to a control instruction specified and the generated audio control signal is transmitted together with an audio signal to be transmitted, so that an apparatus to be controlled receives the audio control signal together with the audio signal, extracts the audio control signal, and executes a control instruction given by the audio control signal. Thus, it is possible to carry out control by way of a control instruction corresponding to an audio control signal.

In the program information transmission apparatus and transmission method according to the present invention, the audio information signal generating means generates an audio information signal corresponding to a program information entered by the program information input means, so that the audio information signal is multiplexed by the signal multiplexing means with an audio signal to be transmitted, thus enabling to transmit a program information as an audio information signal together with an audio signal.

Moreover, in the program reservation apparatus and the program reservation method according to the present invention, the reception means receives an audio information signal indicating a program information transmitted together with an audio signal to be transmitted, and the audio information signal received is extracted by the program information

specifying means, and a program information indicated by the audio information signal is stored in the program information storage means, so that according to a reservation set information entered by the input means, the control means controls the aforementioned reception means to use the program information stored in the program information storage means to reserve a program to be received and to receive the program reserved. Thus, by using a program information indicated by an audio information signal transmitted together with an audio signal to be transmitted, a program reservation can readily be carried out.

Furthermore, in the program reservation apparatus and the program reservation method according to the present invention, the reception means receives an audio information signal indicating a program information transmitted together with an audio signal to be transmitted, and the audio information signal received is recorded/reproduced via a recording medium by the recording/reproduction means, and the audio information signal reproduced is extracted by the program information specifying means, and a program information indicated by the audio information signal is stored in the program information storage means, so that according to a reservation set information entered by the input means, the control means can control the reception means to use a program information stored in the program information storage means, to reserve a program to be received, and receive the program reserved. Thus, by using a program information indicated by an audio information

signal recorded/reproduced together with an audio signal via recording medium, a program reservation can readily be carried out.

WHAT IS CLAIMED IS

1. An audio control signal transmission apparatus comprising:

control instruction input means for specifying a control instruction to be transmitted;

audio control signal generating means for generating an audio control signal corresponding to the control instruction specified by said control instruction input means; and

signal output means for outputting the audio signal to be transmitted and the audio control signal generated by said audio control signal generating means;

wherein said output means outputs an audio control signal corresponding to the control instruction and an audio signal.

2. An audio control signal transmission apparatus as claimed in Claim 1, said apparatus further comprising signal switching means for switching the audio signal to be transmitted, to the audio control signal generated by said audio control signal generating means,

wherein said signal output means outputs the audio control signal and the audio signal supplied via said signal switching means.

3. An audio control signal transmission apparatus as claimed in Claim 1, said apparatus further comprising signal superimposing means for superimposing the audio control signal



generated by said audio control signal generated means, on the audio signal to be transmitted,

wherein said signal output means outputs the audio signal superimposed with an audio control signal corresponding to a control instruction to be transmitted which is supplied via said signal superimposing means.

4. An audio control signal transmission apparatus as claimed in Claim 1, wherein said signal output means transmits to a signal transmission path an audio control signal corresponding to a control instruction and an audio signal to be transmitted.

5. An audio control signal transmission apparatus as claimed in Claim 1, wherein said signal output means is radio transmission apparatus and transmits as a radio wave, an audio control signal corresponding to a control instruction and an audio signal to be transmitted.

6. An audio control signal transmission apparatus as claimed in Claim 1, wherein said signal output means is audio output means and transmits an audio control signal corresponding to a control instruction and an audio signal to be transmitted, as a sound wave.

7. An audio control signal transmission apparatus as claimed in Claim 1, wherein said audio control signal

generating means generates as a control instruction to be transmitted, an audio control signal for giving an operation control instruction for controlling operation of an apparatus to be controlled.

8. An audio control signal transmission apparatus as claimed in Claim 1, wherein said audio control signal generating means generates as a control instruction to be transmitted, an audio control signal for giving a character display control instruction for character display control.

9. An audio control signal transmission apparatus as claimed in Claim 1, wherein said audio control signal generating means generates a DTMF signal string as an audio control signal corresponding to a control instruction to be transmitted.

10. An audio control signal reception apparatus comprising:

signal input means for extracting an audio control signal which has been fed together with an audio signal;

control instruction specifying means for specifying a control instruction given as an audio control signal extracted by said signal input means; and

control instruction output means for outputting the control instruction determined by said control instruction specifying means;

wherein said control instruction output means outputs a control instruction corresponding to an audio control signal fed to said signal input means.

11. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means extracts an audio control signal from an audio signal and an audio control signal which have been time-division multiplexed, and supplies the audio control signal to said control instruction specifying means.

12. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means extracts an audio control signal superimposed on an audio signal, and supplies the audio control signal to said control instruction specifying means.

13. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means is supplied with an audio control signal and an audio signal via a signal transmission path and extracts from the audio control signal and the audio signal, an audio control signal and supplies the audio control signal to said control instruction specifying means.

14. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means includes reception

means for receiving an audio control signal and an audio signal which have been transmitted as a radio wave.

15. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means includes a microphone for detecting an audio control signal and an audio signal which have been outputted as a sound wave.

16. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means extracts an audio control signal which gives an operation control instruction for controlling operation of an apparatus to be controlled.

17. An audio control signal reception apparatus as claimed in Claim 10, wherein said signal input means extracts an audio control signal which gives a character display control instruction for a character display control.

18. An audio signal reception apparatus as claimed in Claim 10, wherein said audio control signal generating means extracts a DTMF signal string as an audio control signal which gives a control instruction.

19. An audio control signal reception apparatus as claimed in Claim 10, said apparatus further comprising means to be controlled for executing a control instruction determined by said control instruction specifying means,

wherein a control instruction corresponding to an audio control signal fed to said signal input means is executed so as to control said means to be controlled.

20. An audio control signal based control system comprising:

an audio control signal transmission apparatus for transmitting an audio control signal corresponding to a control instruction and an audio signal to be transmitted; and

an apparatus to be controlled, which receives an audio control signal transmitted together with an audio signal from said audio control signal transmission apparatus and executes a control instruction given by the audio control signal received,

wherein said apparatus to be controlled is controlled by a control instruction corresponding to an audio control signal transmitted from said audio control signal transmission apparatus.

21. An audio control signal based control system as claimed in Claim 20, wherein said audio control signal transmission apparatus comprises: control instruction input means for specifying a control instruction to be transmitted; an audio control signal generating means for generating an audio control signal corresponding to a control instruction determined by said control instruction input means; and signal output means for outputting an audio signal to be transmitted

and an audio control signal generated by said audio control signal generating means, wherein said signal output means outputs an audio control signal corresponding to a control instruction and an audio signal to be transmitted.

22. An audio control signal based control system as claimed in Claim 20, wherein said apparatus to be controlled comprises: signal input means for extracting an audio control signal fed together with an audio signal; control instruction specifying means for specifying a control instruction given as an audio control signal extracted by said signal input means; and means to be controlled for executing the control instruction determined by said control instruction specifying means, wherein a control instruction corresponding to the audio control signal fed to said signal input means is executed.

23. An audio control signal based control system as claimed in Claim 20, said system comprising:

an audio control signal reception apparatus for outputting as a sound wave a control instruction corresponding to an audio control signal; and

an apparatus to be controlled for executing a control instruction outputted as a sound wave from said audio control signal reception apparatus,

wherein said apparatus to be controlled is controlled by a control instruction corresponding to an audio control signal transmitted from said audio control signal transmission

apparatus.

24. ~~An~~ An audio control signal based control method comprising:

a step of generating an audio control signal corresponding to a control instruction determined;

a step of transmitting said audio control signal together with an audio signal to be transmitted

a step of receiving said audio control signal together with the audio signal;

a step of extracting the audio control signal received; and

a step of executing a control instruction given by said audio control signal.

25. An audio control signal based control method as claimed in Claim 24, wherein an audio signal to be transmitted and said audio control signal are switched between each other so as to be transmitted by way of time division.

26. An audio control signal based control method as claimed in Claim 24, wherein the audio signal to be transmitted is superimposed with said audio control signal when transmitted.

27. An audio control signal based control method as claimed in Claim 24, wherein an audio signal to be transmitted

and said audio control signal are transmitted via a signal transmission path.

28. An audio control signal based control method as claimed in Claim 24, wherein an audio signal to be transmitted and said audio control signal are transmitted as a radio wave.

29. An audio control signal based control method as claimed in Claim 24, wherein an audio signal to be transmitted and said audio control signal are transmitted as a sound wave.

30. An audio control signal based control method as claimed in Claim 24, wherein as said audio control signal, an operation control instruction is transmitted for controlling operation of an apparatus to be controlled.

31. An audio control signal based control method as claimed in Claim 24, wherein as said audio control signal, a character display control instruction is transmitted for a character display control.

32. An audio control signal based control method as claimed in Claim 24, wherein as said audio control signal, a DTMF signal string is transmitted.

33. A program information transmission apparatus comprising:



program information input means for inputting a program information to be transmitted;

audio information signal generating means for generating an audio information signal corresponding to a program information entered by said program information input means;

signal multiplexing means for multiplexing an audio signal to be transmitted, with the audio information signal generated by said audio information signal generating means; and

transmission means for transmitting the audio information signal and the audio signal which have been multiplexed by said signal multiplexing means,

wherein a program information is transmitted as an audio information signal together with an audio signal.

34. A program information transmission apparatus as claimed in Claim 33, wherein said signal multiplexing means is signal switching means for switching an audio signal to be transmitted, to an audio information signal generated by said audio signal information signal generating means.

35. A program information transmission apparatus as claimed in Claim 33, wherein said signal multiplexing means is signal superimposing means for superimposing an audio information signal generated by said audio information signal generating means, on an audio signal to be transmitted.

36. A program information transmission apparatus as

claimed in Claim 33, wherein said transmission means transmits to a signal transmission path, an audio information signal corresponding to a program information and an audio signal to be transmitted.

@ 37. A program information transmission apparatus as claimed in Claim 33, wherein said transmission means is radio transmission means for transmitting as a radio wave, an audio information signal corresponding to a program information and an audio signal to be transmitted.

@ 38. A program information transmission apparatus as claimed in Claim 33, wherein said audio information signal generating means generates a DTMF signal string as an audio information signal corresponding to a program information to be transmitted.

@ 39. A program information transmission apparatus as claimed in Claim 33, wherein said audio information signal generating means generates an audio information signal indicating a G code as a program information to be transmitted.

@ 40. A program information transmission apparatus as claimed in Claim 33, wherein said audio information signal generating means generates a DTMF signal string indicating a G code as a program information to be transmitted.

41. A program information transmission method comprising:  
a step of generating an audio information signal  
corresponding to a program information entered;  
a step of multiplexing an audio signal to be transmitted,  
with said audio information signal; and  
a step of transmitting a program information as an audio  
information signal together with an audio signal.

42. A program information transmission method as claimed  
in Claim 41, wherein the audio signal and the audio information  
signal corresponding to a program information are transmitted  
by way of time division.

@ 43. A program information transmission method as claimed  
in Claim 41, wherein the transmission is carried out by  
superimposing the audio information signal corresponding to a  
program information, on the audio signal to be transmitted.

44. A program information transmission method as claimed  
in Claim 41, wherein a DTMF signal string is generated as the  
audio information signal corresponding to a program information  
to be transmitted, so that the program information is  
transmitted by the DTMF signal string.

@ 45. A program information transmission method as claimed  
in Claim 41, wherein an audio information signal indicating a  
G code is generated as a program information to be transmitted,

so that the program information is transmitted by the the audio information signal indicating the G code.

@ 46. A program information transmission method as claimed in Claim 41, wherein a DTMF signal string indicating a G code is generated as a program information to be transmitted, so that the program information is transmitted by the DTMF signal string indicating the G code.

47. A program reservation apparatus comprising:  
reception means for receiving an audio information signal indicating a program information transmitted together with an audio signal to be transmitted;

program information specifying means for extracting the audio information signal received by said reception means and specifying a program information indicated by said audio information signal;

program information storage means for storing the program information determined by said program information specifying means;

control means for controlling said reception means; and  
input means for inputting a set information to said control means,

@ wherein said control means, according to a reservation set information entered by said input means, by using a program information stored in said program information storage means, controls said reception means to reserve a program to be

received and receive the program reserved.

48. A program reservation apparatus as claimed in Claim 47, said apparatus further comprising recording means for recording on a recording medium an audio signal received by said reception means,

wherein said control means, according to a reservation set information entered by said input means, by using a program information stored in said program information storage means, controls said reception means and said recording means to reserve a program to be recorded and to record on a recording medium an audio signal of the program reserved.

49. A program reservation apparatus as claimed in Claim 47, wherein

said reception means receives a video/audio signal, and

said control means, according to a reservation set information entered by said input means, by using a program information stored in said program information storage means, controls said reception means and said recording means to reserve a program to be recorded and to record on a recording medium a video/audio signal of the program reserved.

@ 50. A program reservation apparatus as claimed in Claim 49, wherein said control means controls to execute an image display of the program information stored by said program information storage means and accept a reservation set information entered

by said input means while said program information is displayed on a screen, thus carrying out a program reservation.

51. A program reservation apparatus as claimed in Claim 49, wherein said program information specifying means specifies a program information according to a DTMF signal string given as said audio information signal.

52. A program reservation apparatus as claimed in Claim 49, wherein said program information specifying means specifies a program information according to a G code given as said audio information signal.

53. A program reservation apparatus as claimed in Claim 49, wherein said program information specifying means specifies a program information according to a DTMF signal string indicating a G code given as said audio information signal.

54. A program reservation apparatus as claimed in Claim 49, wherein said control means specifies a program information according to a DTMF signal string indicating a G code given as said audio information signal.

@ 55. A program reservation apparatus as claimed in Claim 47, said apparatus further comprising recording/reproduction means for recording and reproducing via a recording means the audion information signal and the audio signal received by said

reception means,

wherein an audio information signal reproduced by said recording/reproduction means is extracted so that a program information indicated by said audio information signal is determined by said program information specifying means.

~~56.~~ A program reservation method in which control is made comprising:

a step of receiving a program information transmitted together with an audio signal to be transmitted;

a step of specifying and storing a program information indicated by the audio information signal received;

a step of using a program information stored, according to a reservation set information entered, and reserving a program to be received; and

a step of receiving the program reserved.

57. A program reservation method as claimed in Claim 56, wherein control is made so that according to a reservation set information entered, a program information stored is used to reserve a program to be recorded in a recording medium, and

an audio signal of the program reserved is received and recorded on a recording medium.

58. A program reservation method as claimed in Claim 56, wherein control is made so that according to a reservation set information entered, a program information stored is used to

reserve a program to be recorded, and

a video/audio signal of the program reserved is received and recorded on a recording medium.

59. A program reservation method as claimed in Claim 56, wherein control is made to display on a screen a program information stored, and

a reservation set information is accepted while said program information is on a screen, so as to execute a program reservation.

60. A program reservation method as claimed in Claim 56, wherein a program information is determined according to a DTMF signal string given as said audio information signal.

61. A program reservation method as claimed in Claim 56, wherein a program information is determined according to a G code given as said audio information signal.

62. A program reservation method as claimed in Claim 56, wherein a program information is determined according to a DTMF signal string indicating a G code given as said audio information signal.

63. A program reservation method as claimed in Claim 56, wherein an audio information signal received is recorded/reproduced together with an audio signal via a



recording medium, and by extracting an audio information signal reproduced, a program information indicated by said audio information signal is determined.

## ABSTRACT

An audio control signal transmission apparatus and reception apparatus, an audio control signal based control system and control method, a program information transmission apparatus and transmission method, and a program reservation apparatus and program reservation method which can realize a control system in which a control signal is superimposed on an audio signal so as to be transmitted and to operate at a distance a reception apparatus capable of receiving the signal and an apparatus connected to the reception apparatus.

## Declaration and Power of Attorney For Patent Application

### 特許出願宣言書及び委任状

#### Japanese Language Declaration

#### 日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書籍、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one named is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

AUDIO CONTROL SIGNAL TRANSMISSION APPARATUS AND RECEPTION APPARATUS, CONTROL SYSTEM AND CONTROL METHOD USING AN AUDIO CONTROL SIGNAL, PROGRAM INFORMATION TRANSMISSION APPARATUS AND TRANSMISSION METHOD, AND PROGRAM RESERVATION APPARATUS AND PROGRAM RESERVATION METHOD

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ 月 日に提出され、米国出願番号または特許協定条約国際出願番号を \_\_\_\_\_ とし、  
(該当する場合) \_\_\_\_\_ に訂正されました。

☐ was filed on \_\_\_\_\_ as United States Application Number or PCT International Application Number \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

私は、米国法典第35編119条(a)-(d)項又は365条(b)項に基づき下記の、米国以外の国の少なくとも一ヶ国を指定している特許協力条約365(a)項に基づき国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Japanese Language Declaration 日本語宣言書			
Prior Foreign Application(s) 外国での先行出願		Priority Not Claimed 優先権主張なし	
<u>P09-201868</u> (Number) (番号)	<u>Japan</u> (Country) (国名)	<u>28 July 1997</u> (Day/Month/Year Filed) (出願年月日)	_____
<u>P09-201869</u> (Number) (番号)	<u>Japan</u> (Country) (国名)	<u>28 July 1997</u> (Day/Month/Year Filed) (出願年月日)	<u>X</u>
<p>私は、第35編米国法典119条(e)項に基いて下記の米国特許出願規定に記載された権利をここに主張いたします。</p> <p>(Application No.) (Filing Date) (出願番号) (出願日)</p>		<p>I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.</p> <p>(Application No.) (Filing Date) (出願番号) (出願日)</p>	
<p>私は、下記の米国法典第35編120条に基いて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約365条(c)に基づく権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。</p> <p>(Application No.) (Filing Date) (出願番号) (出願日)</p>		<p>I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.</p> <p>(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)</p> <p>(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)</p>	

## Japanese Language Declaration

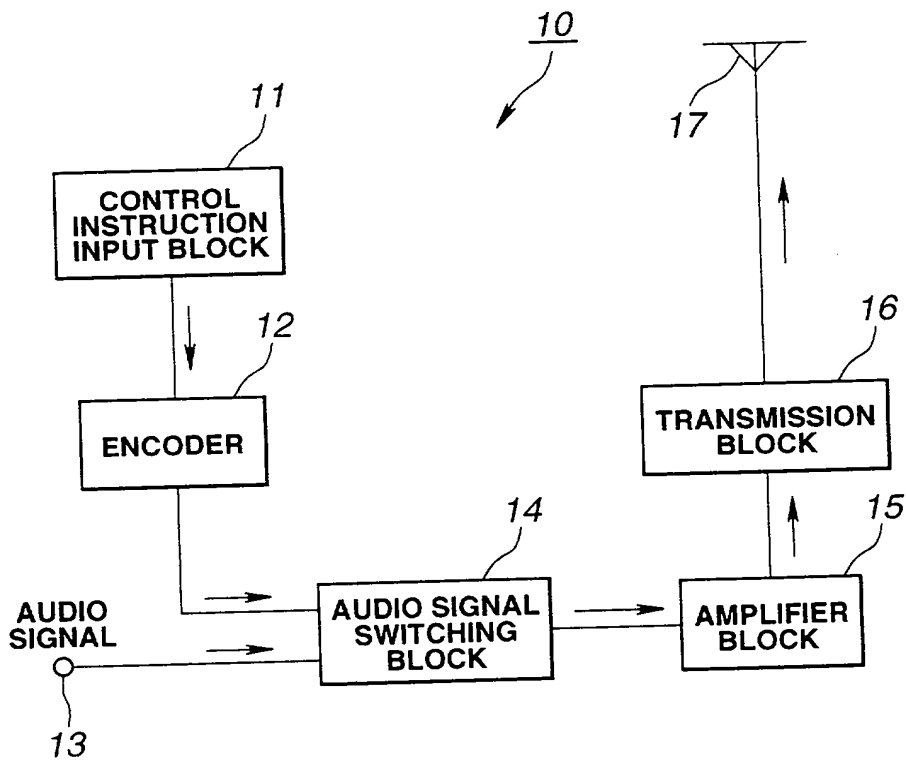
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may be jeopardize the validity of the application or any patent issued thereon.

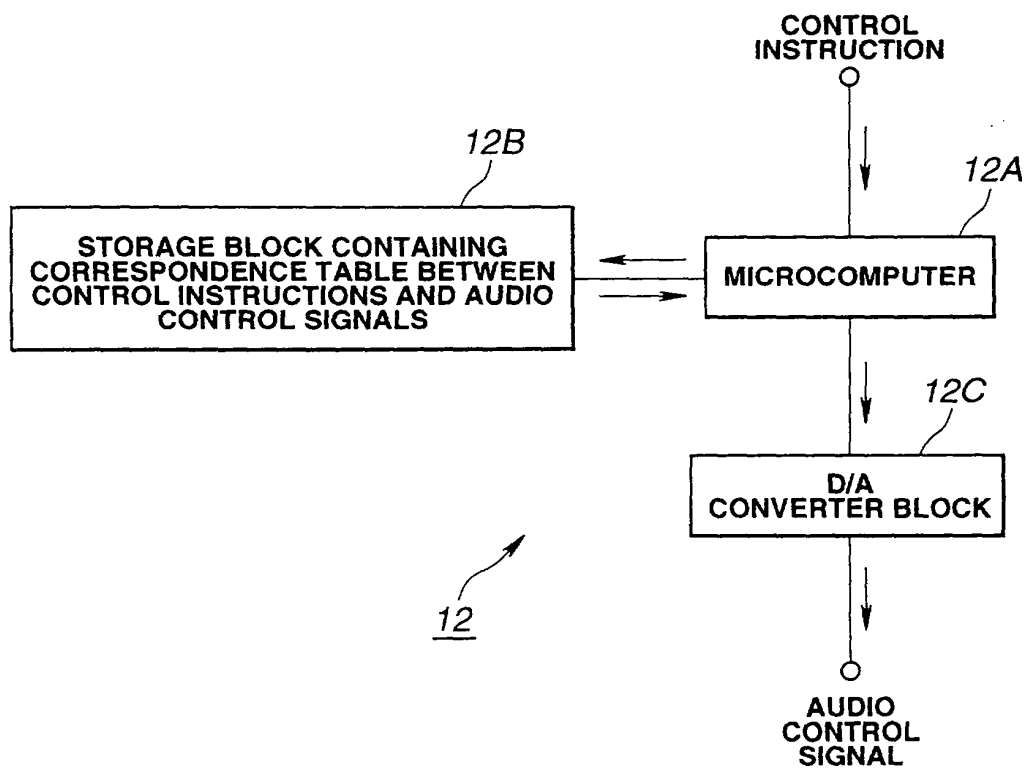
Japanese Language Declaration 日本語宣言書					
委任状： 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。（弁理士、または代理人の氏名及び登録番号を明記のこと）			POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark office connected therewith (list name and registration number)		
Karl A. Limbach	18,689	W. Patrick Bengtsson	32,456	Kyla L. Harriel	P-41,816
George C. Limbach	19,305	Mark A. Dalla Valle	34,147	Mayumi Maeda	40,075
John K. Uilkema	20,282	Charles P. Sammut	28,901	Kent J. Tobin	39,496
Neil A. Smith	25,441	Mark C. Pickering	36,239	Christine S. Ring	P-42,106
Veronica C. Devitt	29,375	Kathleen A. Frost	37,326	Michael R. Ward	38,651
Ronald L. Yin	27,607	Alan S. Hodes	38,185	Steven M. Santisi	40,157
Gerald T. Sekimura	30,103	Patricia Coleman James	37,155	Charles L. Hamilton	P-42,624
Michael A. Stallman	29,444	Alan A. Limbach	39,749	Andrew V. Smith	P-43,132
Philip A. Girard	28,848	Douglas C. Limbach	35,249	Heath W. Hoglund	41,076
Michael J. Pollock	29,098	Brian J. Keating	39,520	J. Thomas McCarthy	22,420
Stephen M. Everett	30,050	Seong-Kun Oh*			
Alfred A. Equitz	30,922	Cameron A. King	P-41,897		
			* Recognition under 37 CFR 10.9(b)		
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唯一または第一発明者名			Full name of sole or first inventor:		
			KOICHIRO WATANABE		
発明者の署名	日付	Inventor's signature		Date	
住所		Residence			
		Saitama, Japan			
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		Japan			
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**FIG.1**

552210-621652



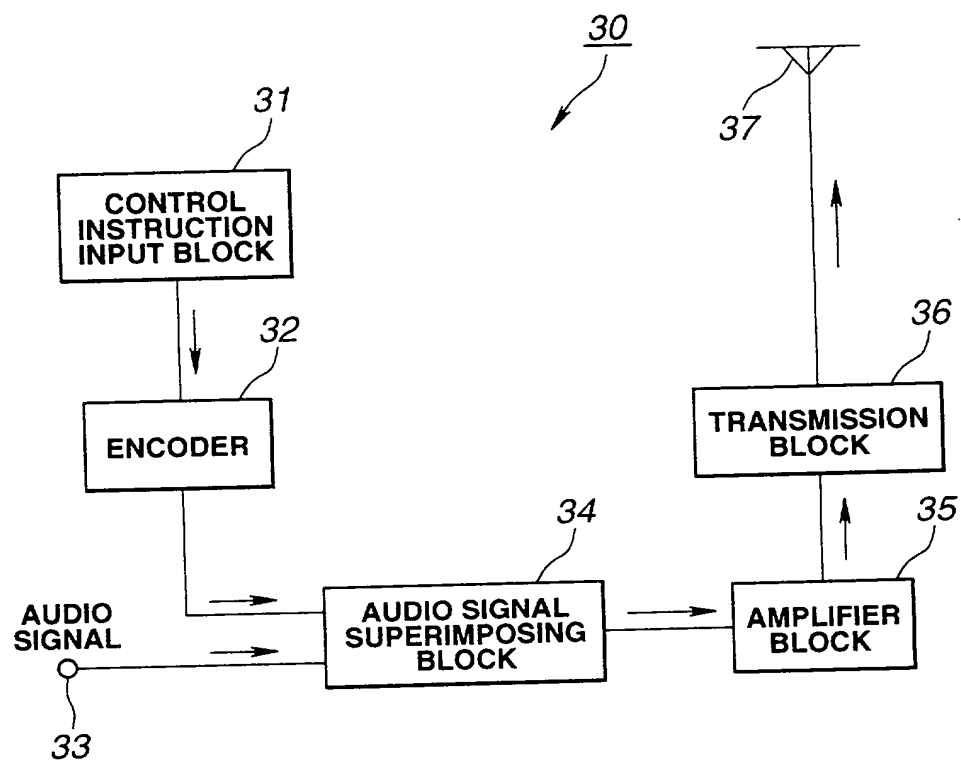
**FIG.2**



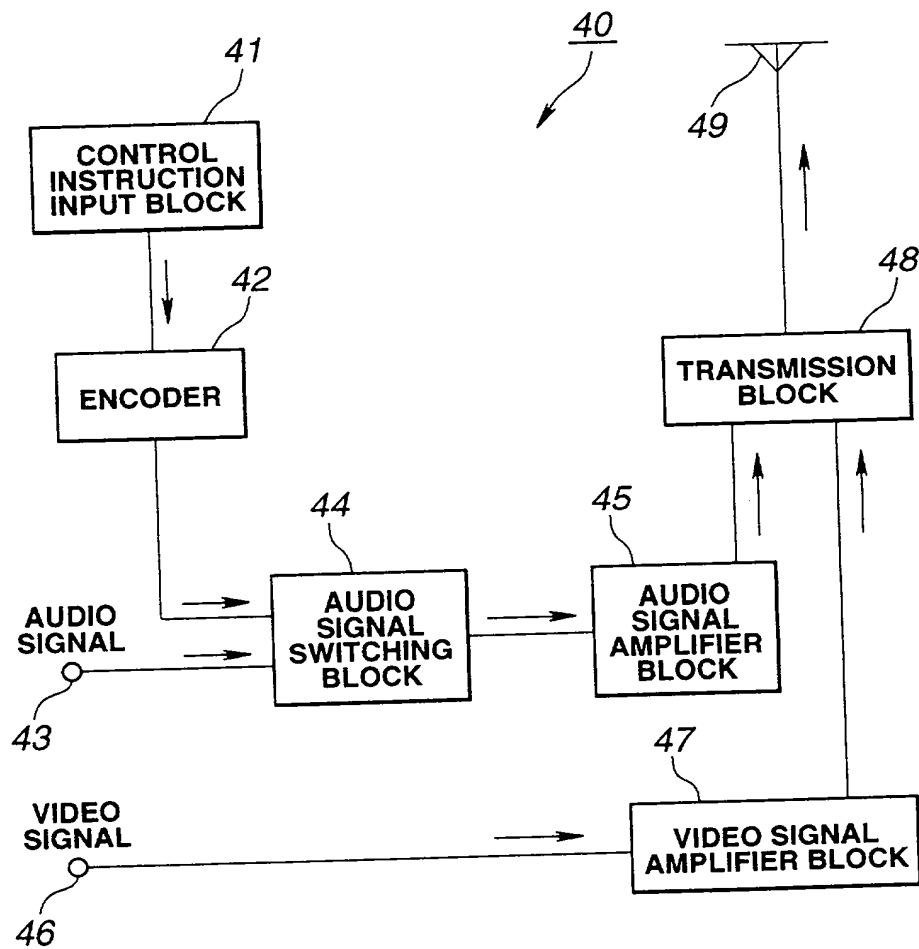
**FIG.3**

```
graph TD; AS[AUDIO SIGNAL] --> BPF[BPF 25A]; BPF --> ADC[A/D CONVERTER BLOCK 25B]; ADC --> MC[MICROCOMPUTER 25C]; MC <--> SB[STORAGE BLOCK CONTAINING CORRESPONDENCE TABLE BETWEEN CONTROL INSTRUCTIONS AND AUDIO CONTROL SIGNALS 25D]; MC --> CI[CONTROL INSTRUCTIONS];
```

**FIG.4**

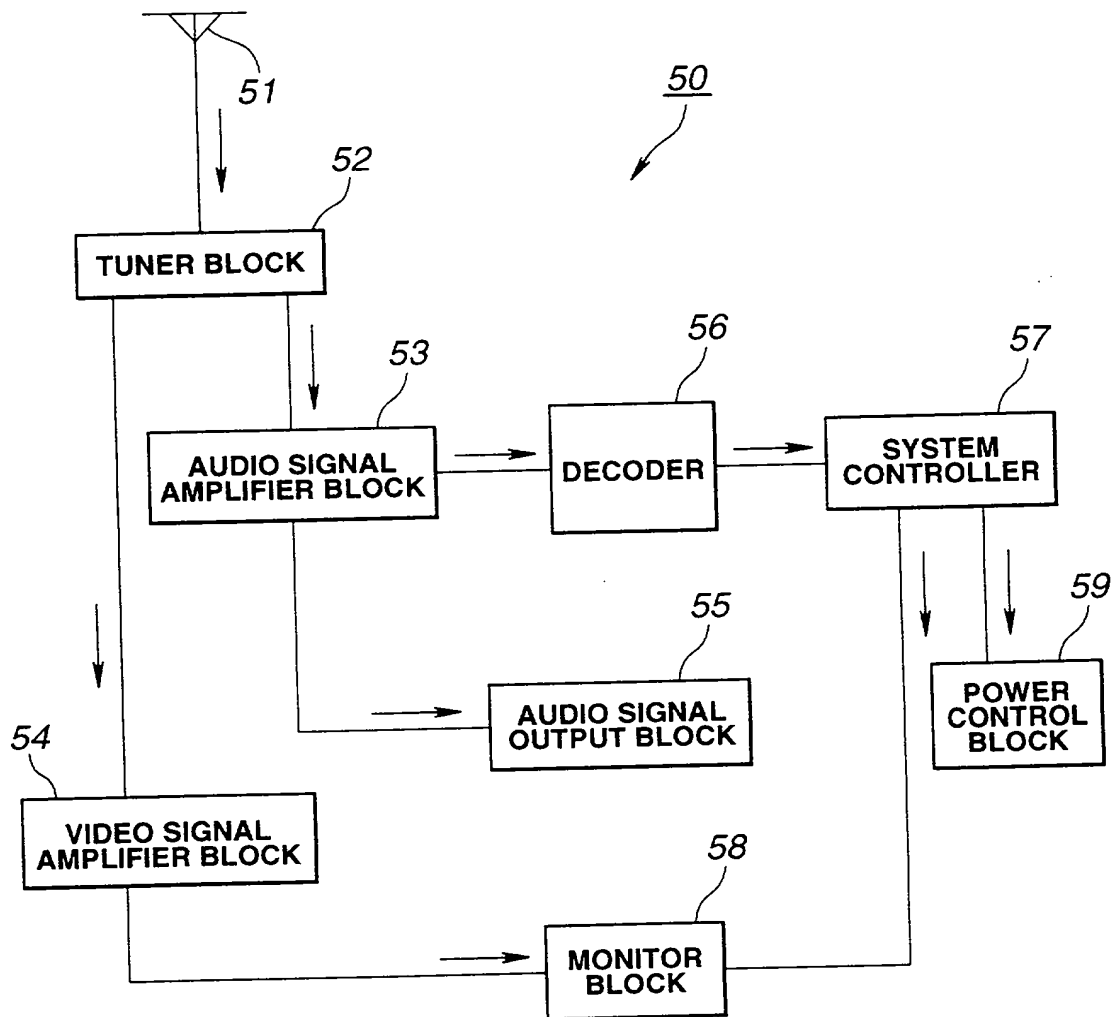


**FIG.5**

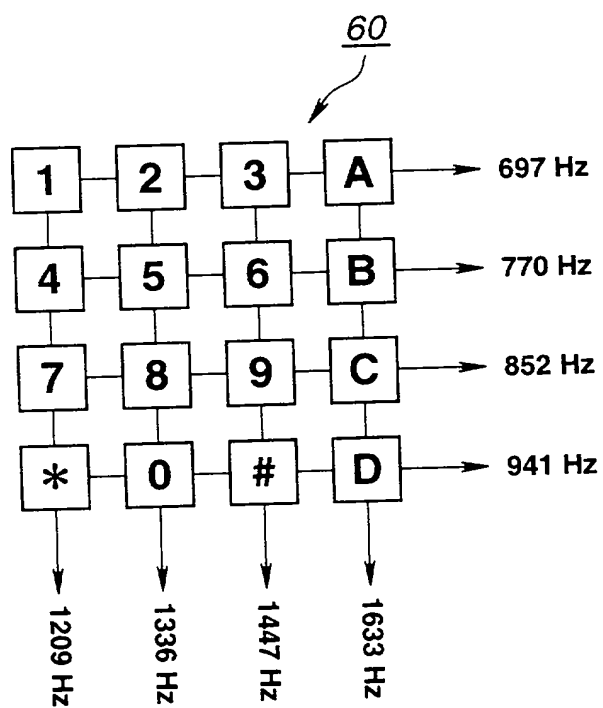


**FIG.6**

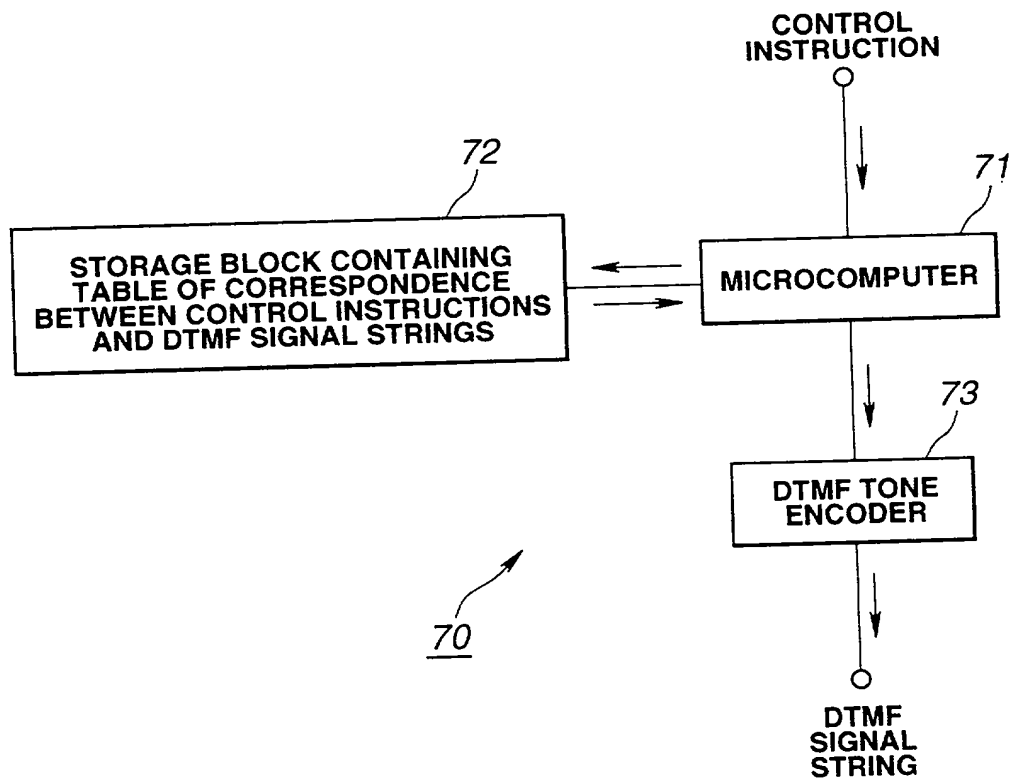
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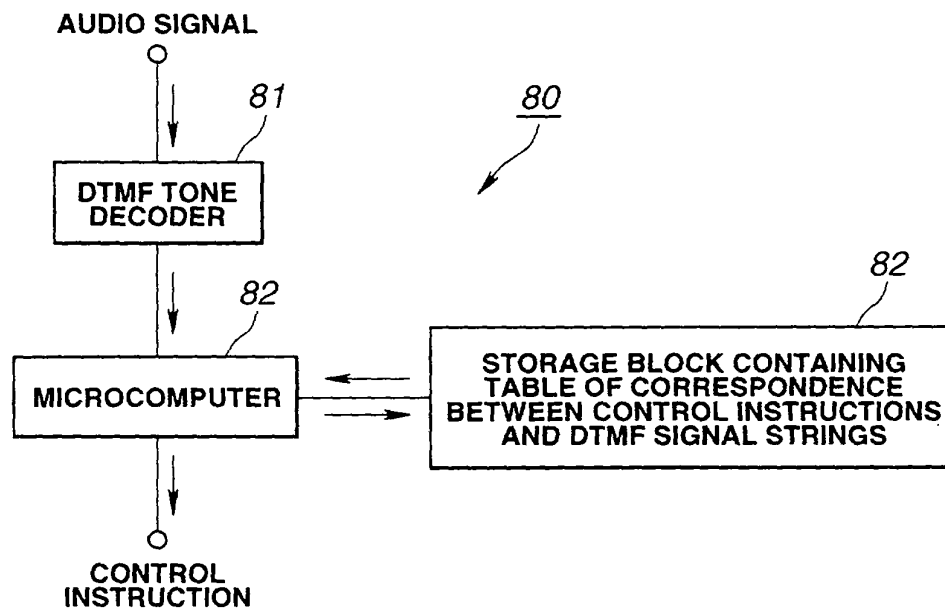
**FIG.7**

[illegible]

**FIG.8**



**FIG.9**

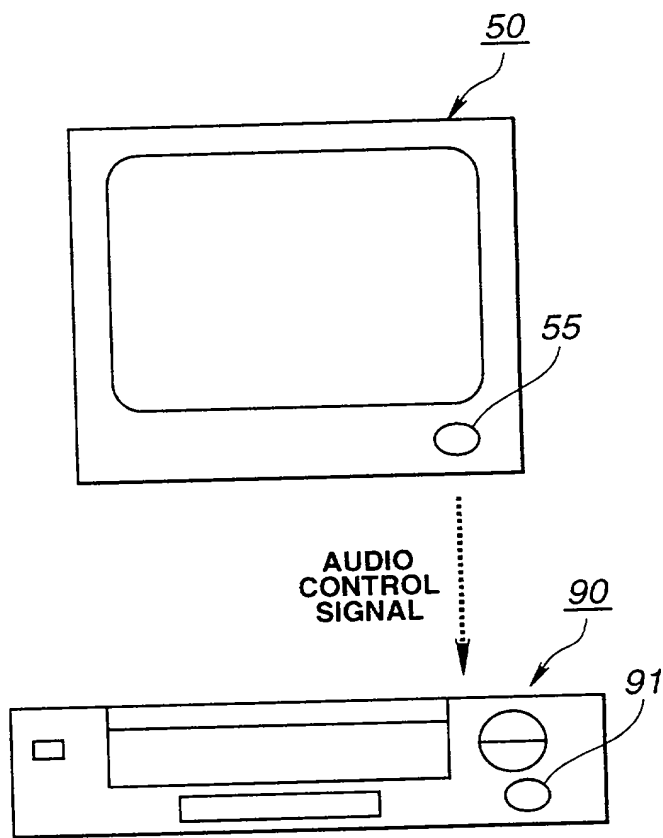


**FIG.10**

CONTROL INSTRUCTION	AUDIO CONTROL SIGNAL (DTMF SIGNAL STRING)
VIDEO OUTPUT OFF	1 #
VIDEO OUTPUT ON	2 #
POWER OFF	3 #

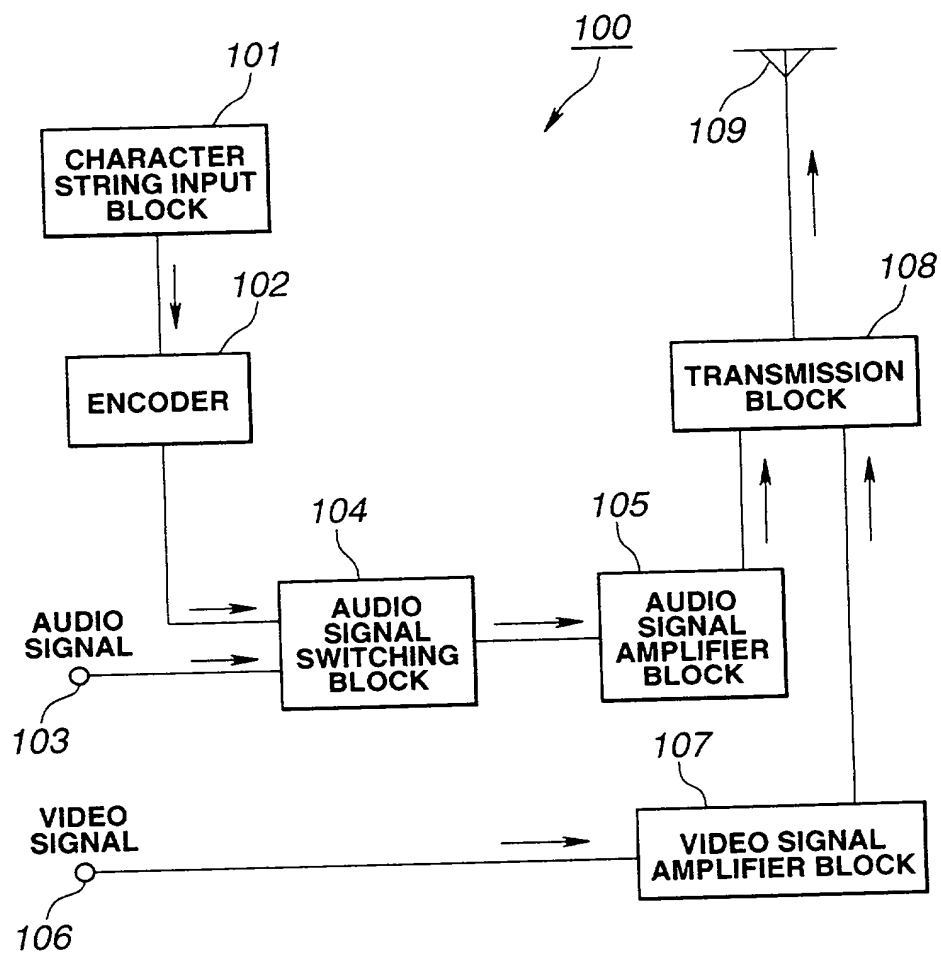
**FIG.11**





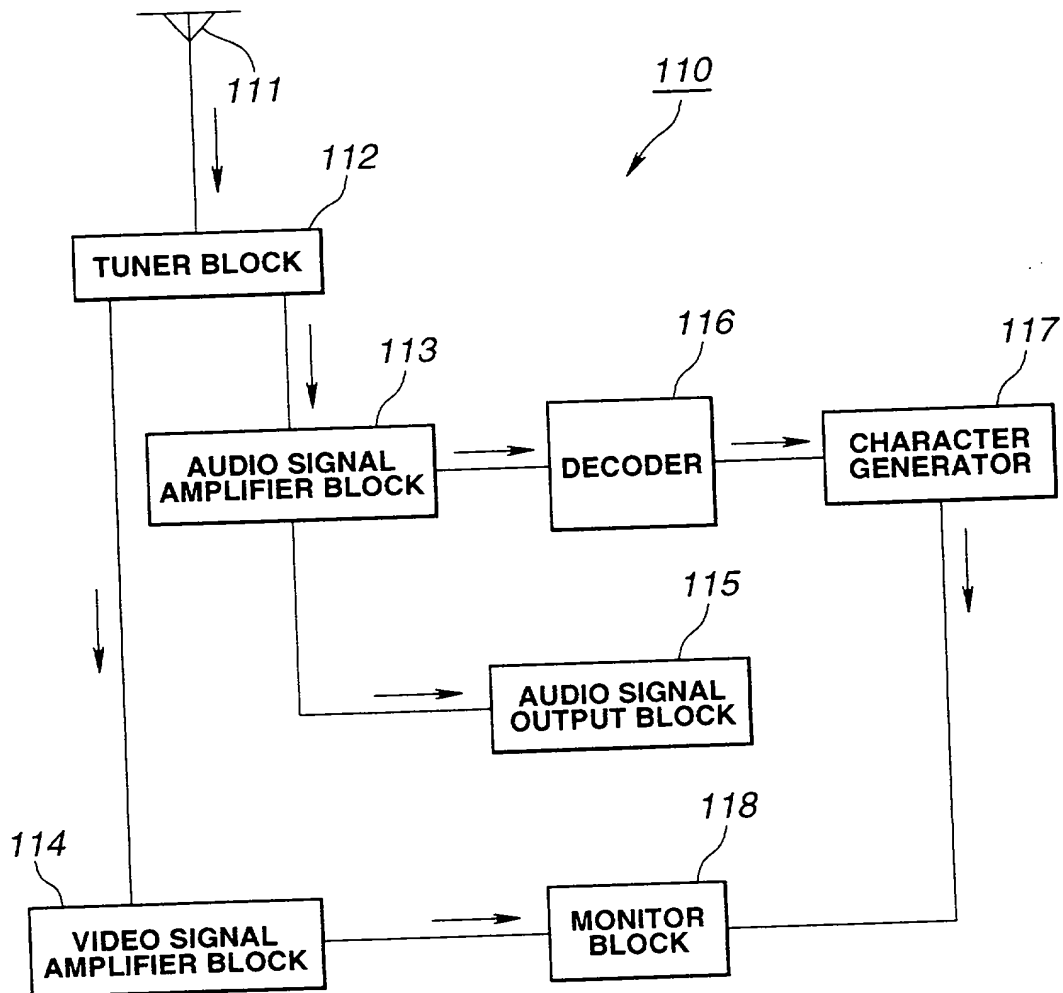
**FIG.12**





**FIG.14**

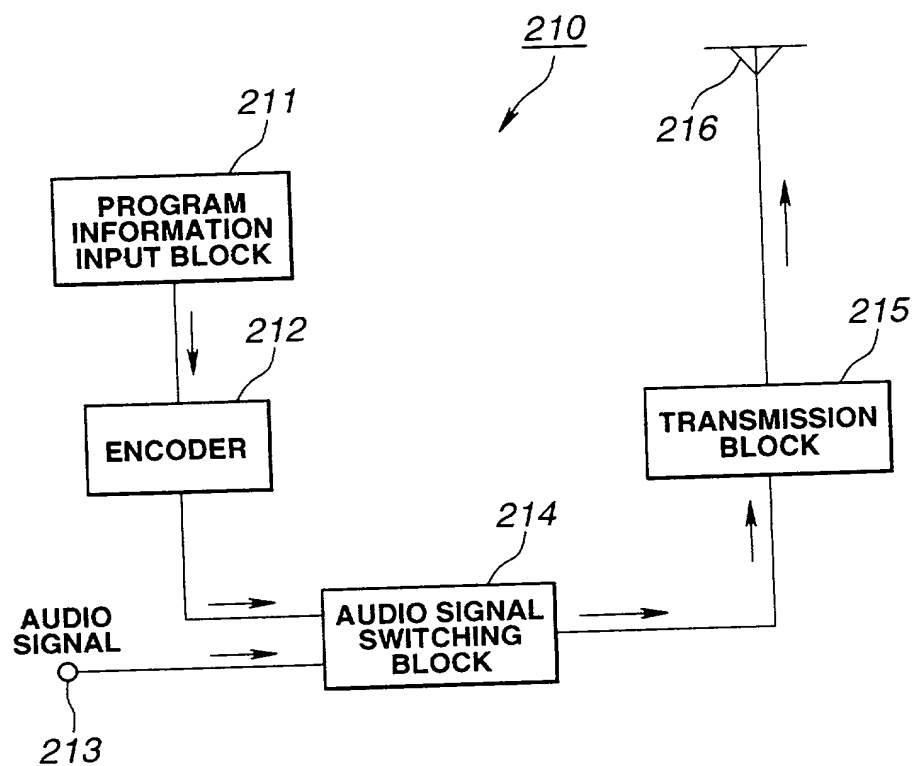
2025-07-20 09:27:00



**FIG.15**

CHARACTER INFORMATION	AUDIO CHARACTER SIGNAL (DTMF SIGNAL STRING)
A	001#
B	002#
AB	003#

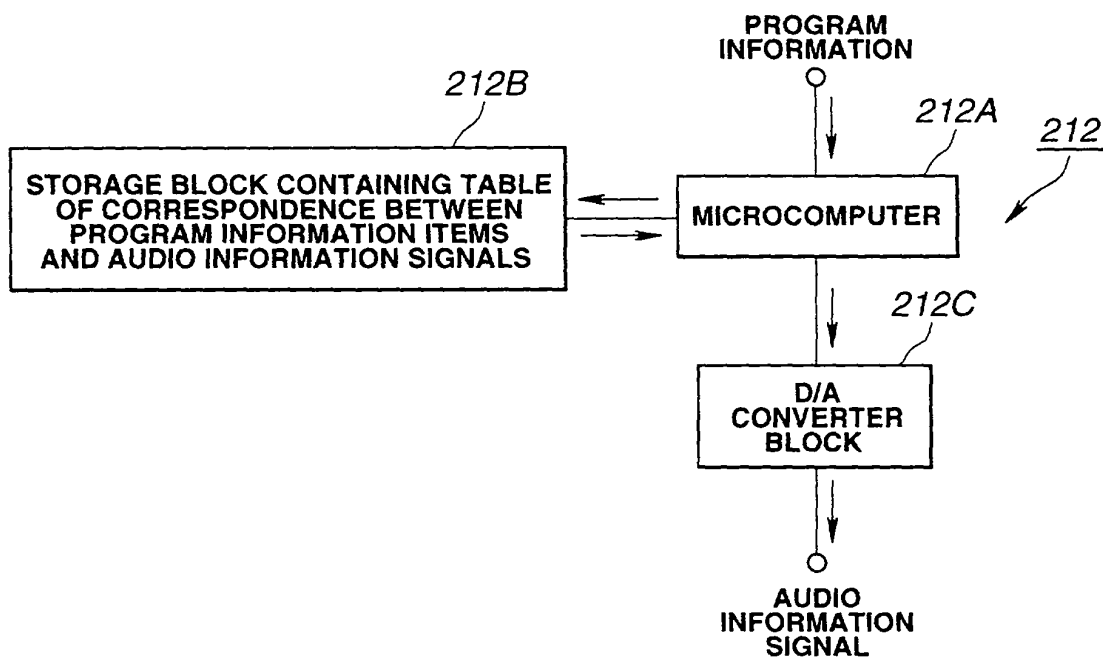
**FIG.16**



**FIG.17**

RECORDING DATE
RECORDING START TIME
RECORDING END TIME
BROADCAST CHANNEL

**FIG.18**



**FIG.19**

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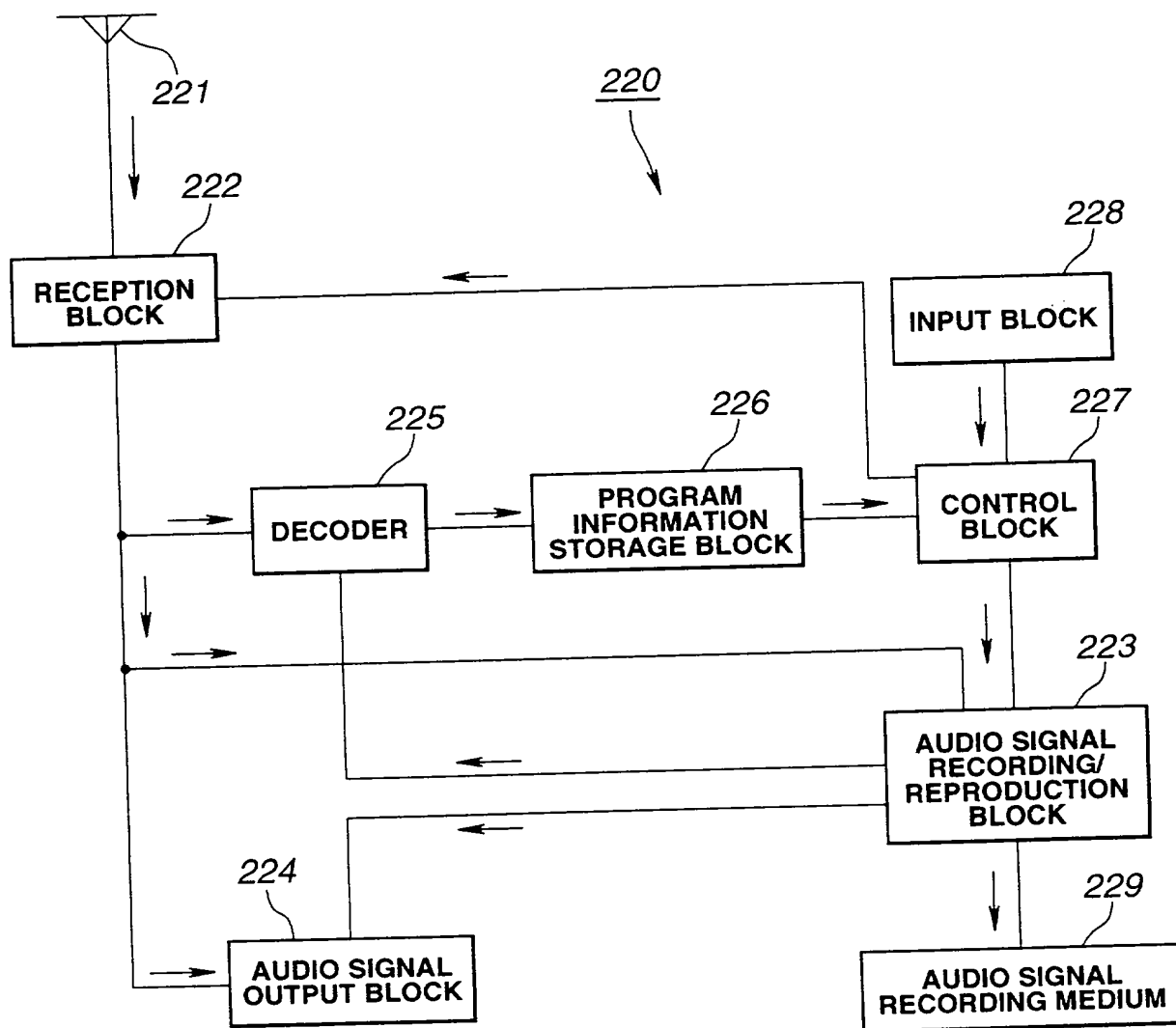


FIG.20



```

graph TD
    AS[AUDIO SIGNAL] --> BPF[BPF]
    BPF --> ADC[A/D CONVERTER BLOCK]
    ADC --> MC[MICROCOMPUTER]
    MC <--> SB[STORAGE BLOCK CONTAINING TABLE OF CORRESPONDENCE BETWEEN PROGRAM INFORMATION ITEMS AND AUDIO INFORMATION SIGNALS]
    MC --> PI[PROGRAM INFORMATION]
    subgraph 225 [225]
        BPF
        ADC
        MC
        SB
    end
    style 225 fill:none,stroke:none

```

**FIG.21**

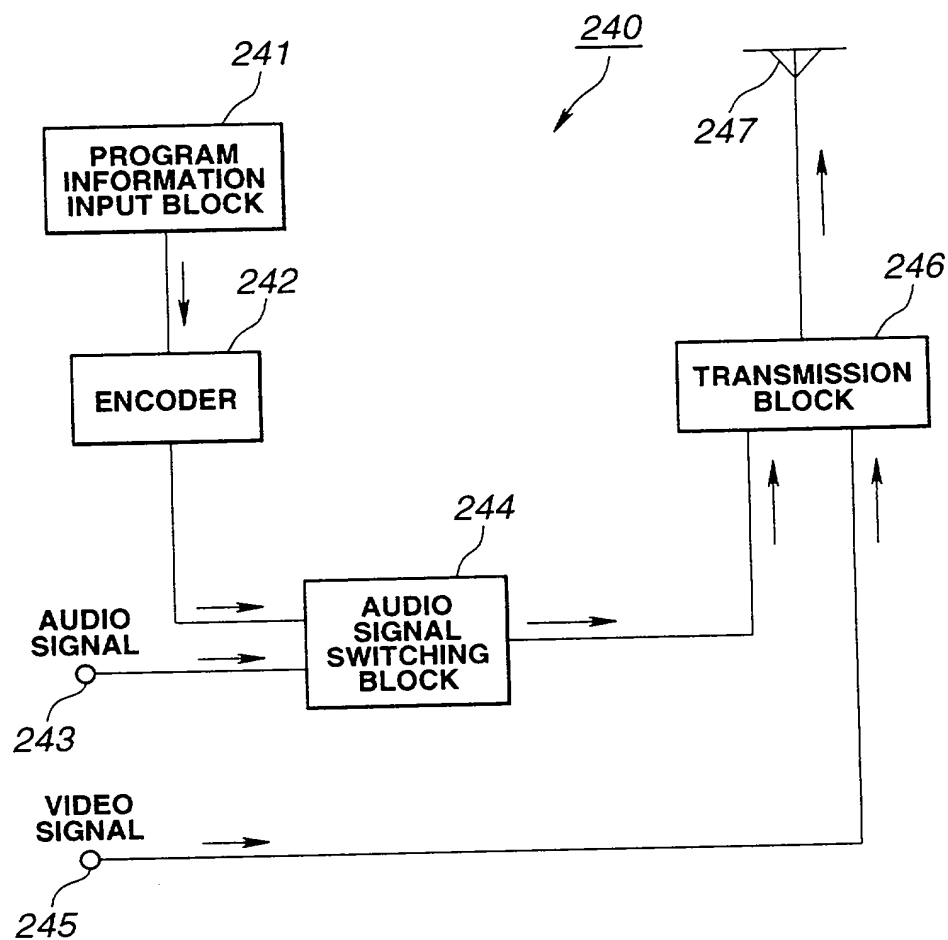
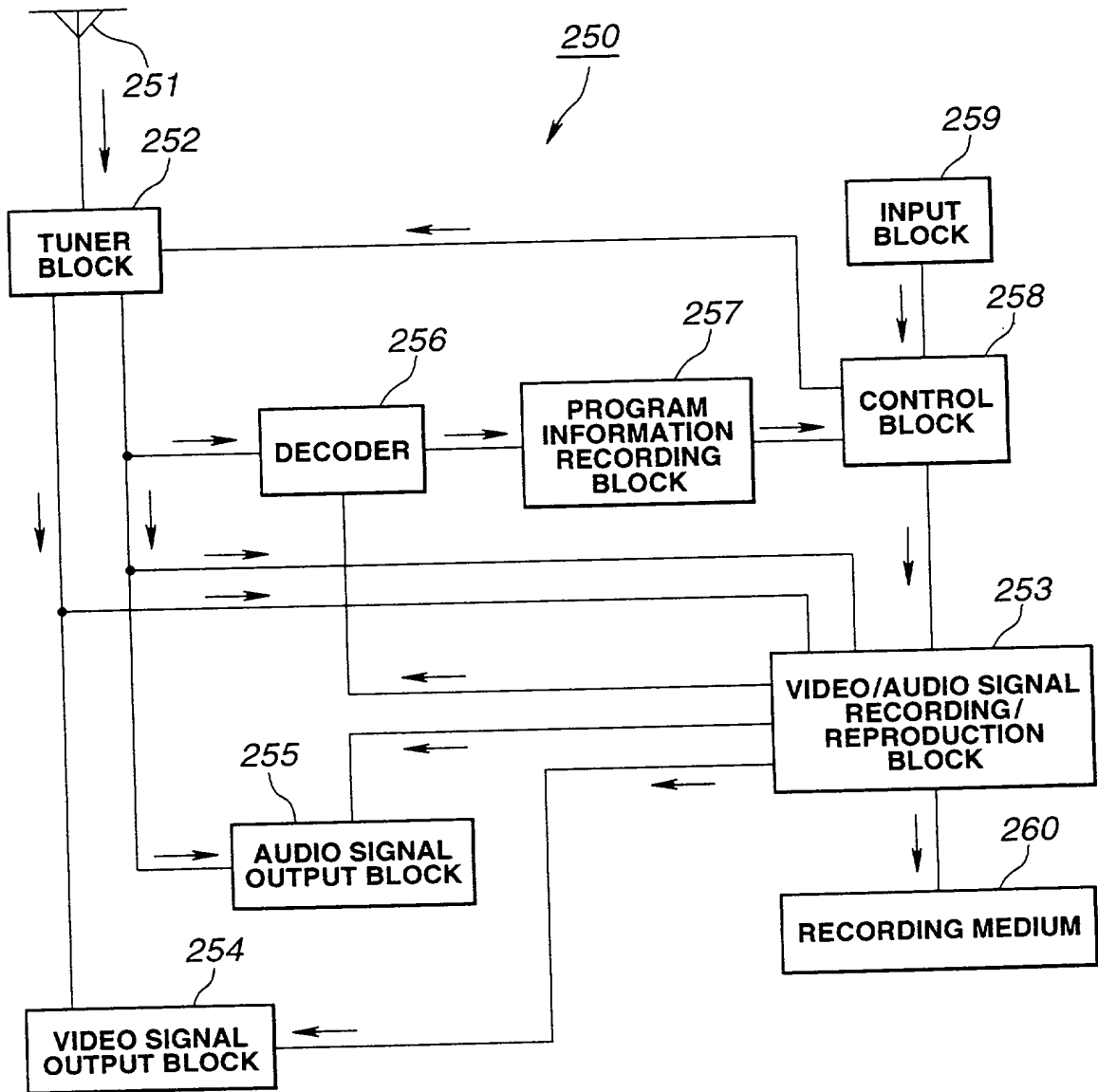


FIG.22



**FIG.23**

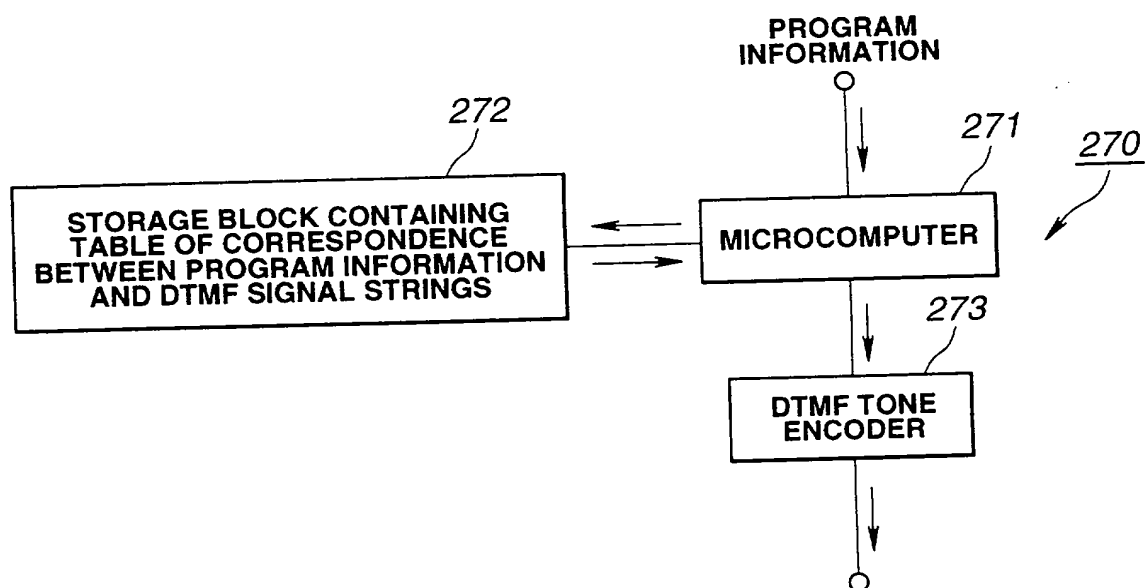
[illegible]

FIG.24

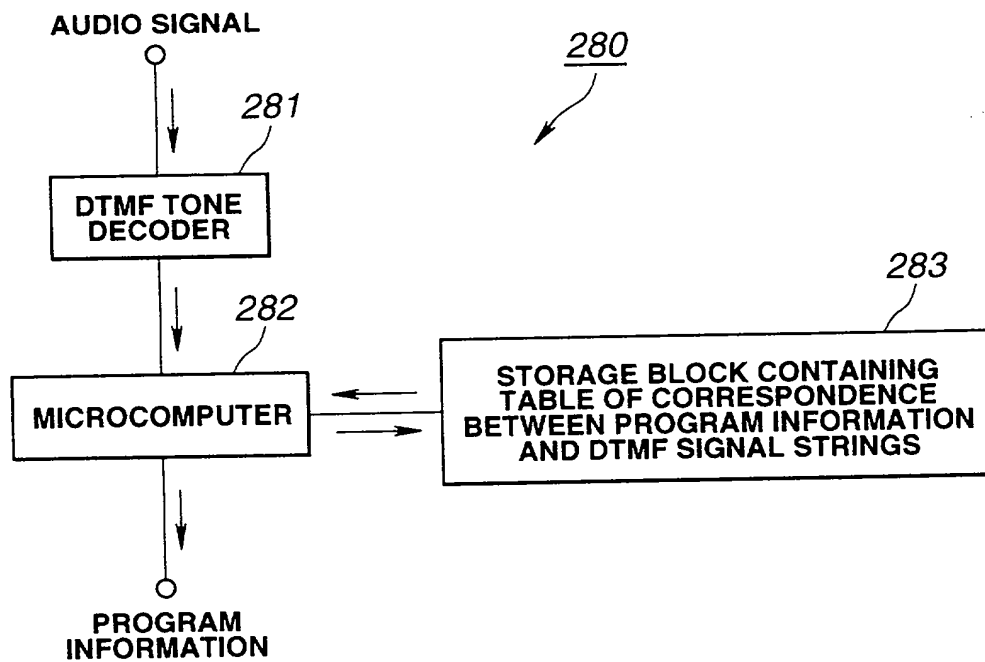
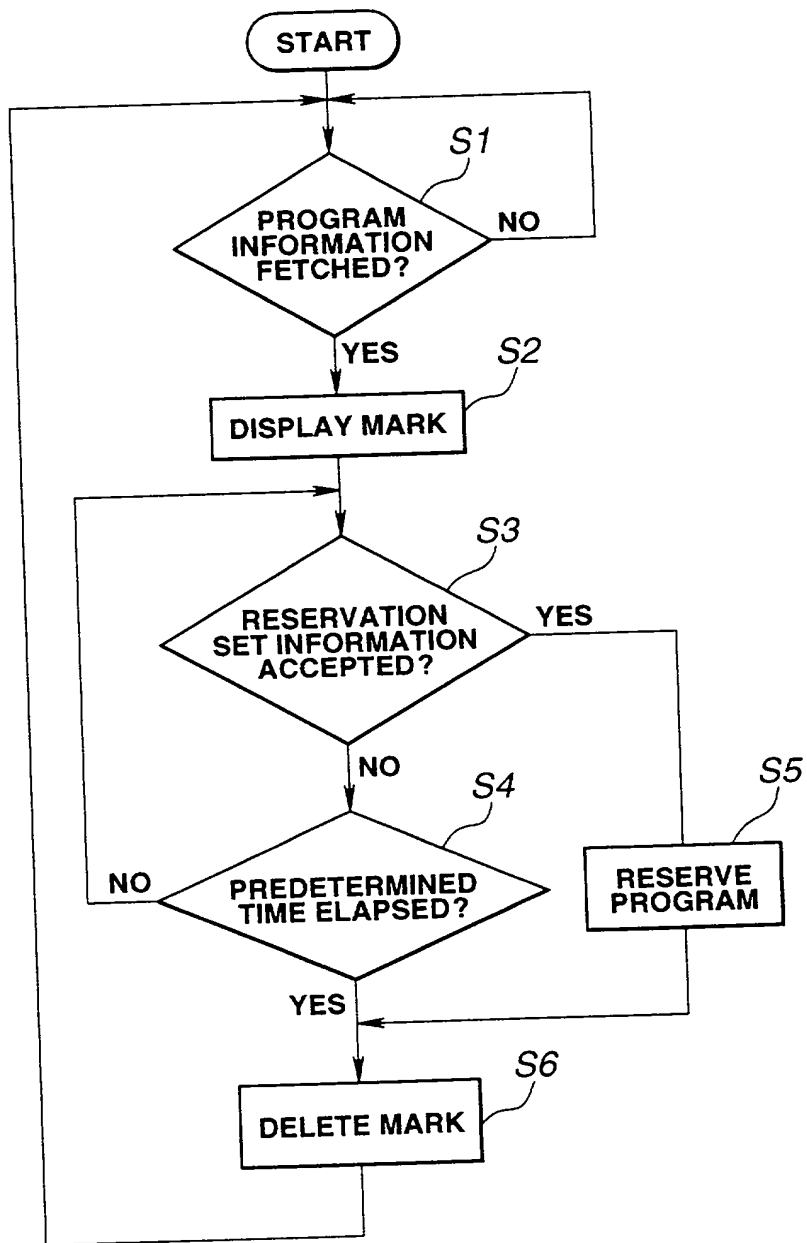


FIG.25

0940043-072720

DATA No.	CONTENTS
DATA #0	[ # ]
DATA #1	[ * ]
DATA #2	PROGRAM BROADCAST DATE, MONTH 10'S POSITION
DATA #3	PROGRAM BROADCAST DATE, MONTH 1'S POSITION
DATA #4	PROGRAM BROADCAST DATE, DAY 10'S POSITION
DATA #5	PROGRAM BROADCAST DATE, DAY 1'S POSITION
DATA #6	PROGRAM START TIME, HOUR 10'S POSITION
DATA #7	PROGRAM START TIME, HOUR 1'S POSITION
DATA #8	PROGRAM START TIME, MINUTE 10'S POSITION
DATA #9	PROGRAM START TIME, MINUTE 1'S POSITION
DATA #10	PROGRAM END TIME, HOUR 10'S POSITION
DATA #11	PROGRAM END TIME, HOUR 1'S POSITION
DATA #12	PROGRAM END TIME, MINUTE 10'S POSITION
DATA #13	PROGRAM END TIME, MINUTE 1'S POSITION
DATA #14	BROADCAST CHANNEL, 100'S POSITION
DATA #15	BROADCAST CHANNEL, 10'S POSITION
DATA #16	BROADCAST CHANNEL, 1'S POSITION

**FIG.26**



**FIG.27**

